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CLASSIFICATION OF COASTAL ENVIRONMENTS
TECHNICAL REPORT 20

UNIVERSITY OF VIRGINIA COASTAL INFORMATION SYSTEM: DESIGN OF A COMPUTERIZED DATA INVENTORY

LEVEL IV

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NOVEMBER, 1978

OFFICE OF NAVAL RESEARCH
GEOGRAPHY PROGRAMS
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Abstract

This report contains a comprehensive description of the University of Virginia Coastal Information System (UVAIS) data and model inventory, including an explanation of how the design evolved to its present form and a detailed discussion of each data element in the file. In addition, the appendices contain all the technical information - program listings, coding table, file definition, report definitions, sample outputs, etc. - available concerning the interface between the inventory and the SHARP Data Management System (DMS). SHARP (Ship Analysis and Retrieval Program) is a computerized DMS based at the David W. Taylor Naval Ship Research and Development Center, Carderock, Maryland.

Introduction

The University of Virginia Information System (UVAIS) is a catalogue or inventory of sources of coastal data, including how and where the data were obtained, and of models pertaining to coastal dynamics. It does not contain the actual data or models but provides information about them and how they can be acquired. The catalogue information is coded and stored in a computerized file for rapid updating, retrieval, and output. The file contains a separate record for each research study or data set, each site where data were collected, and each model.

A user can obtain information from the file through the use of queries in which he specifies certain criteria that must be met by each record retrieved. The following information or record types are available: 1) common data records containing information on a data source such as whom to contact, storage medium, relevant publications, etc., 2) specific data records containing information about each individual site in a study, such as coordinates, dates of operation, etc., and 3) model records containing information about models, such as the type of model, whom to contact, source language, etc. Each record type has a separate output report format designed to present information in decoded form.

To assist uninitiated users in accessing the file as it exists under the SHARP data management system, a special "tutorial" program is available which leads the user step-by-step through the construction of a query to retrieve specific data records. The tutorial package includes "information sections" which describe the instruments and techniques most frequently used to measure certain key parameters and give references to recognized experts in the field.

It may be desirable at some point to abandon SHARP and transfer UVAIS to some other data management system. A fortran program called REFORMAT has been written for this contingency. REFORMAT reads the SHARP input cards and dissects the data into separate elements.

Data Catalogue File Design

The process of developing and designing the UVAIS data catalogue encompassed three main steps:

1) determination of information to be included;
2) selection of a computerized data management system;
3) design of the computer file.

1. The information requirements of the users and managers of the system were the primary determinant of what should be included in the data catalogue. The intended users of the catalogue are coastal scientists and engineers and research administrators. We envisioned that scientific users would mainly be interested in locating data sets that could be used to test theories and models or to compare with their own data; engineering users would want information about data sets that could be used to determine conditions existing at proposed construction sites; and administrative users would want to know about existing data so that they could plan their research programs to avoid duplication of effort. As scientists and data users ourselves; we compiled a list of essential elements of infomation (EEI's) about data sets that are required to make a preliminary judgement of the data's usefulness and to acquire the data if desired. The EEI's are:

1) what data have been and are being collected;
2) when, where, and by what means were and are the data collected;
3) who collected the data;
4) where are the data now and in what form are they stored;
5) what publications or reports contain the data or analyses of the data;

6) what restrictions are placed on the use or availability of the data;
7) what is the quality of the data.

All of the above elements are included in the catalogue except the last one. The quality or accuracy of data is a subjective determination best made by examination of the actual data. Since it is not practicable to examine every data set referenced in the catalogue, we have tried to supply additional information whenever possible that might give the user some idea of the data quality. This information includes: the time and space frequency of data points; the percentage of gaps in the data record caused by equipment malfunctions, weather, etc.; manufacturers' names and model numbers of instruments; and a brief description of procedures and purposes. One additional element, the name of the sponsoring agency, was added for the use of research administrators.

The items of information selected for inclusion in the UVAIS data catalogue are basically the same as those in the Environmental Data index (ENDEX), a data referral service run by the NOAA Environmental Data Service. However, ENDEX has several problems caused in part by its attempt to cater to users in all the natural sciences. We have tried to eliminate most of these problems by tailoring our system specifically for coastal investigators and by taking a different approach to the presentation of information. The main emphasis in ENDEX is on identification of data sets with much less attention paid to sites, methods, and dates of data collection. Also, ENDEX groups all parameters, physical, biological, and geological, with no distinction between the main object of the study and least significant parameter measured. In UVAIS we have placed considerable emphasis upon

providing detailed information about site locations, dates, and methods and have tried to group related parameters whenever practical. In addition, we have limited our interest to physical, geological, and meteorological data collected in the coastal zone.

The elements of information selected for the UVAIS data catalogue fall into two categories:

1) information that pertains in general to a research study or data file, e.g., publications, principal investigator, location of the data, etc.;
2) information pertaining to the details of data collection at specific sites and on specific dates, e.g., site locations, frequency, method, and dates of observations, etc.

One set of information in category 1 is required to describe each data set, and each site at which data were collected requires a separate set of category 2 information. Two fill-in-the-blanks type forms were designed to record information for the data catalogue. The first, called the common data form, is used to record category 1 information that is common to an entire study; the second, specific data form, is for category 2 information that is specific to individual sites. These forms were later revised to conform to the computerized file in sequence and format of information in order to simplify the process of coding the information for input. There are examples of the final versions of both data forms in the appendices.

2. Having determined what information should go into the catalogue, the next step was to design a computer file that would allow for input, storage, and selected retrieval of the information. We wanted a system that would allow uninitiated users to interact with the computer with little or no outside guidance or prior instruction. Such a system could be designed and programmed from scratch, but it seemed much more efficient

and practical to find an existing computerized data management system (DMS) that would meet our needs. In this search we considered the GYPSY system used by ENDEX and owned by the University of Oklahoma. GYPSY required an initial purchase of software, and setup and maintenance on a University of Virginia computer. As a result, it was rejected. The U.S. Geological Survey's GRASP system was rejected because it lacks a report formatting capability.

The SHARP (Ships Analysis and Retrieval Program) system at the David W. Taylor Naval Ship Research and Development Center (NSRDC) in Carderock, Maryland, met most of our requirements, and was selected, despite a few disadvantages, for the following attributes:

1) user-oriented English-like language for query purposes;
2) simple file definition, input, output, and report formatting procedures clearly explained in a well-written, comprehensive manual;
3) capability for multiple record types within a single file;
4) coded translation capability, i.e., information input in a short coded format is output in plain language;
5) capability for changing the file definition, within limits, without affecting data already on file;
6) ability to interface with a custom-written query program, called the "Tutorial" mode, designed to guide novice users in construction of a query;
7) Navy-owned system operational at three locations, NSRDC, Norfolk, and San Diego;

8) batch and interactive access to the system at NSRDC available via telephone;
9) system programs would be provided at cost if required.

If the data catalogue is to be expanded and continued indefinitely, we would recommend moving it to a different DMS since SHARP has a number of non-fatal limitations. The two most serious problems are SHARP's unformatted input and its report definitions. The unformatted input requires separate identification of each data element which adds significantly to the time required for coding, keypunching, and quality control prior to input. In addition, the SHARP system allows little flexibility in output report formats which makes it difficult to define a report that would make sense to a reader who is unfamiliar with the contents of the file. The report definition capability does not allow the print position of an item to be specified explicitly, nor does it allow the use of any labels or explanatory text other than the nine-character names assigned to the elements in the file definition.

3. The final step in the file design was to fit the selected items of information into the format required by the SHARP DMS. The two main factors considered in this process were: 1) which elements would be most desirable and suitable for query purposes, and 2) what input format would produce the best output. Ease of input and minimization of repetition were additional factors affecting the design of the file.

In SHARP, elements on which queries can be run are placed in an inverted file. These elements are designated by the word "INVERT" in the file definition. In a typical query, one seeks to retrieve all records satisfying certain criteria. These criteria are usually met by a match between data values supplied

in the query and the values contained in specific inverted elements within the records on file. Because the data values must match exactly, errors can be reduced by putting short, rigidly formatted, coded or numerical data into inverted elements. Coded elements are especially good for querying because the set of possible values is limited to those listed in the coded table. Any element having a textual or free format or an unlimited range of values is unsuitable for querying because the user can never be sure of selecting the exact value or all of the possible entries that might be of interest to him. Anyone who has ever used a general subject index is familiar with this problem. Therefore, when designing the UVAIS computer file, we first identified those elements on which a user might want to query and then made them either coded or numerical in the file definition. Nineteen out of 44 elements were inverted which is probably more than necessary. A reduction in the number of inverted elements should reduce storage costs and search time, however this becomes academic if the file is moved to another DMS that does not use an inverted file.

Only five or fewer elements are used in most queries; they are: parameter (phenomenon measured), latitude, longitude, ocean, and country. The geographic coordinates (latitude and longitude) have a rigid format and a limited range of numeric and alphabetic values so that they meet our requirements for querying elements. All the other inverted elements are either rigidly formatted dates or are coded. The element "Parameter" is similar to a subject keyword system, but we are careful to avoid any synonyms or overlaps between different parameters and purposely chose parameter names covering broad categories of data so that the total number of parameters could be kept relatively low. For specialists who find the parameter categories too broad, the element "Variable" allows queries to be run on smaller subsets of each parameter. Some parameters have

over twenty related variables. There may be overlaps between some variables, so that one should be careful when using them in queries.

The second consideration in file design was the relationship between the input and output formats. This relationship has three components: the element name; the length of the element name; and the size of the element or of its decoded value. Under SHARP, the only way to label items of information in an output report is to use the element names which are limited to ten characters, only nine of which are printed on output. Therefore each element name is a carefully chosen abbreviation or mnemonic which can serve as a label for the contents of the element. Horizontal spacing in output reports is another problem under SHARP; all spacing is based on the length of the element name and the size of the element or of its decoded value for coded elements. The system adds a colon and one space between an element name and the element value and inserts two spaces between elements. For repeating elements, those having more than one data value, the element name can be requested with each repetition of data, and the appropriate number of spaces will be left each time even though the name will actually be printed only once. With a report format in mind, we manipulated the sizes of some of the elements and element names to achieve the desired horizontal spacing on output. The elements affected are identified in the section on data element definitions.

Ease of input was another factor in the file design. This was accomplished mainly by defining as many coded elements as possible, because the codes, being short and readily available in the coding table, can be entered rapidly. All elements with frequently recurring values were made coded. A code for "see remarks" was included to take care of unusual cases. Besides making input easier, codes provide a degree of uniformity in the file's contents by restricting each coder to the same set of possible entries.

The two categories of information, general and site specific, included in the data catalogue had an influence on the computer file design. We wanted to have a separate record in the file for each site where data were collected, but general information about a data set could not be included in each site record without excessive duplication of input because some data sets were compiled from tens or hundreds of sites. The only apparent solution was to define two different record types: a Type 1 record for each study or data set containing general data, common to all the sites in the study; and a Type 2 record for site specific data. This is possible under SHARP because the same elements do not have to appear in all records. Having settled on two record types the next question was how to link the Type 1 record and all the Type 2 records pertaining to a particular data set. Cross referencing was accomplished through the use of a two part record identification number. The first part is a four-digit serial number (0001 through 9999) assigned to each Type 1 record. Each Type 2 record has the same serial number as its associated Type 1 record plus an additional three-digit serial number separated by a hyphen. The Type 1 numbers are unique within the entire file, while the three-digit Type 2 numbers start at 001 for each Type 1 number. The two record types can be separated in queries by a check for the occurrence of particular inverted elements that are present in only one of the record types. Separate report formats were designed for each record type.

In addition to the actual definition of the data elements, the process of file design included setting up a coding table and defining output reports. Initially the coding table was quite short, containing only one sample code for some elements. Additional codes have been added as necessary. The principal elements for which codes are added are country, ocean, parameter, variable, and method. A copy of the complete coding table is contained in the appendices.

As mentioned above, separate reports were defined for Type 1 and Type 2 records; these are called Report TP1 and Report TP2 respectively. Another report, called RCO, was designed to list the record identification number, country, and ocean for each record. When used with a special query, Report RCO provides an audit of the file contents by parameter, country, and ocean. Final versions of all report definitions are contained in the appendices.

Design of the Model Catalogue

The model catalogue, containing information about computer, graphical, and other types of models of interest to coastal investigators, was set up after the data catalogue had already been in operation for over a year. Because there are a relatively small number of models which are actually operational and useful, we decided to incorporate the model file into the existing data file by adding elements of information pertaining to models.

Many of the elements in the data catalogue, especially category 1 information (publications, principal investigator, sponsor, availability, etc.) are also used in the model catalogue. A third category of information was added to provide details pertaining only to models (input and output format, computer type and language, calibration procedures, etc.). As with the data file, we first decided what information to include and then formatted it to go into the SHARP system. As many elements as practicable were defined to be coded and those suitable for query purposes were inverted. Element names and lengths were adjusted to provide the desired horizontal spacing on output as was done with the data catalogue. A new report format, Report MOD, was defined for models, and the coding table was expanded to include the new coded elements.

At the time the model file was being developed, a synonym capability for element names was added to SHARP. This makes possible the assignment of two or more names to the same element, so that in an output report, whichever name is specified will appear. Several of the category 1 elements used in both the data and model catalogues had names that were inappropriate in the model file. Therefore synonymous names for those elements were added to the file definition and the new names are used in Report MOD.

Data Element Definitions

Each data element in the UVA Information System is defined and described below. The first part of each description is the element number and definition taken verbatim from the SHARP data definition for the UVAIS1 file; see the SHARP Manual for an explanation of terms.

The types of records in which each element is used follow; there are three different record types:

Type 1 - Data catalogue records containing general information about research projects or data sets.

Type 2 - Data catalogue records containing information about data observations at particular sites.

Type 3 - Model catalogue records containing information about models that may be of interest to coastal investigators.

The final portion of each element description is an explanation of the type of information in the element with examples where appropriate, a discussion of the use or purpose of the element if that is not self-evident, and reasons for the input and output formats chosen for the element.

```
O)RCDID;MAXSIZE = 8;CHARS 1/4;NUMERIC;CHAR 5; SPACES OR
  VALUE = -:CHARS 6/8;NUMERIC OR SPACES;INVERT
```

Occurrence: All records

Record Identification Number: This is a number assigned to each record in the file which uniquely identifies that record; it is comprised of two parts. The first part is a four digit number assigned sequentially in order of input to each research study or data set described in the file. The second part, separated from the first by a hyphen, is a three digit serial number assigned to each record describing a site where data were collected for a particular study. Type 1 records, containing general information about a study or data set, have only a four-digit identification number, while Type 2 records, containing site information, have two-part numbers. Since each research study will have one or more sites where data are collected, the Type 1 (study) and Type 2 (site) records must be related or cross-referenced in some way. This is accomplished by using the four-digit Type 1 number to form the first part of the identification number for each related Type 2 record. Thus the record number is not only a unique identifier but also acts as a cross reference between related records. Type 3 records are numbered serially starting with 9999-001. Some thought was originally given to designing a record identification number that would contain information about the locations of data collection sites or about types of data collected. This type of identifier still requires a serial number for uniqueness when locators are duplicated, and if the cross-referencing feature is retained, the total package becomes unwieldy. Therefore, the simpler design of cross-referenced serial numbers was selected.

2)PROC/DATE;MAXSIZE = 6;INVERT

Occurrence: all records

Processing Date: This is the date of the latest change made in a record. If there have been no changes, it is the date of input. The SHARP DMS maintains this element automatically, so that it is transparent to the user. PROC/DATE is inverted for use in file maintenance queries, for example, to retrieve all records changed on a certain date to check the results of the update.

3)INFODATE;MAXSIZE = 4;CHARS 1/2;RANGE = 00/99;CHARS 3/4; SPACES OR RANGE = 00/12

Occurrence: Type 1 and 3 records

Information Date: The date of information is entered in the format YYMM (year/month). This is the date of the latest information used in writing up a study. The date of information is a concept (intelligence-cut-off date) used and understood in the intelligence community, but there is some confusion about its use in this context. Sometimes the date on which the study is actually written up is mistakenly entered in this element. For recent and ongoing studies the dates of information and writing-up usually are quite close, but for old studies, the dates may be several years apart if the information was taken from publications. Because of this confusion, the information date is not output, but the element is retained for possible use in the future.

4)STUDY;MAXSIZE = 60

Occurrence: Type 1 and 3 records.

Study Name: This element contains the name assigned to the research study, data set, or model. It should be descriptive, giving an idea of the types of data and locations where they were collected. The name is entered in free text up to 60 characters. This size permits output of the name on one line when a teletype terminal is used having a maximum line length of 72 characters.

5) STUDY-TYPE; SIZE = 1;RANGE = 1/4;REPEAT;INVERT;CODED; DECSIZE = 16

Occurrence: Type 1 and 3 records

Study Type: Studies are put into one or more of the following categories - site specific, data summary, long-time series, synoptic scale, or model. These categories, although not mutually exclusive, provide information that can be used in determining the possible usefulness of a data set. Therefore, the element is inverted so that it can be used in queries. It is coded for ease of input and to facilitate querying.

6) DATA-TYPE; SIZE = 1;RANGE = 1/4;INVERT;CODED;DECSIZE = 18

Occurrence: Type 1 records

Type of Data: The data are classified as real (measured) or synthetic (generated by models, e.g., wave hindcasts). This element is inverted so that a user can design his query to select only real data sets, for example. It is coded to facilitate input and querying.

7) PARAMETER; SIZE = 2;NUMERIC;REPEAT;INVERT;CODED; DECSIZE = 19

Occurrence: All records

Parameter: A parameter is generalized oceanographic, meteorologic, geologic, or geographic entity or phenomenon on which data are commonly collected. All parameters measured during a study or at a site or generated by a model are reported in this element. Examples of parameters, as we define them, are waves, tides, salinity, sediments, beach morphology, and bathymetry. The parameters are general so that their number is small and their categories are broad, both of which simplify the task of designing a query to retrieve all records of interest. For example, a user interested in surf observations can ask for "waves" and be assured of not missing any records. Element 48 (variable) is available if a user wants to be more specific in his query. Parameter is coded for uniformity and ease of input and to facilitate querying.

8)MEDIUM; SIZE = 1;NUMERIC;REPEAT;CODED;DECSIZE = 20
Occurrence: Type 1 records

Medium: Data can be stored or recorded on various media - magnetic tape, punched cards, field notes, etc. The storage media are noted in this element which is coded to facilitate input and to promote uniformity by providing a fixed set of terms that can be used.

9)DATA-AVAL; SIZE = 1;NUMERIC;REPEAT;CODED;DECSIZE = 30
Occurrence: Type 1 and 3 records

Data Availability: Restrictions on the availability or use of the data or model are noted in this element. It is coded for uniformity and ease of input.

10)ANALYSES; SIZE = 1;RANGE = 1/3;INVERT;CODED;DECSIZE = 36
Occurrence: Type 1 records

Analyses: Often data are not analyzed until several years after collection. This element is used to record the state of analysis of the data (analyzed, not analyzed, or unknown). If the data have been analyzed, the user is referred to the remarks section for a brief description of the analysis procedures. This element is coded for uniformity and ease of input and for query purposes.

11)TYP2RCDS; MAXSIZE = 3; INTEGER
Occurrence: Type 1 records

Type 2 Records: The number of Type 2 records associated with a given study is recorded in this element. It is classified as an integer so that it can be used in mathematical calculations (mainly addition) by the SHARP data management system.

12)CONTACT; MAXSIZE = 60
Occurrence: Type 1 and 3 records

Contact Name: The name of the person or agency to contact in order to obtain data or a model is entered in free text. Size is limited to 60 characters to permit output on one line by a teletype with a line length of 72 characters. The contact's address is entered in elements 13 through 15. It would be better to make element 12 repeating and put the whole address in one element making input a little easier and facilitating output considerably.

13)CONINST; MAXSIZE 60

Occurrence: Type 1 and 3 records

Contact Institution: Name of the institution or agency to contact is entered. See element 12 for discussion.

14)CONADD; MAXSIZE = 60

Occurrence: Type 1 and 3 records

Contact Address: Street address of the contact is entered. See element 12 for discussion.

15)CONSTAT; MAXSIZE = 60

Occurrence: Type 1 and 3 records

Contact State: The contact's city and state is entered. See element 12 for discussion.

16)TELEPHONE; MAXSIZE = 13

Occurrence: Type 1 and 3 records

Telephone: The area code and telephone number of the contact is entered.

17)PUBLICATNS; MAXSIZE = 60;REPEAT

Occurrence: Type 1 and 3 records

Publications: Publication references pertaining to the study or model are entered in free text and are separarated by semi-colons into groups of 60 or fewer characters. The maximum entry size of 60 characters enables each entry to be output on one line by a teletype. The

60-character, repeating entry format allows the coder to explicitly define each line of output, and it greatly facilitates corrections and updates because any entry in a repeating element can be selectively changed or deleted and additional entries can be added.

18)SOURCES; MAXSIZE = 60;REPEAT

Occurrence: Type 1 and 3 records

Sources: The sources of information used in writing up a study or model are entered in free text. Sources include publications, personal contacts, and the name of the person who wrote up the study. This information is used in-house to assist in updating and correcting records. The maximum size permits output on one line by a teletype.

19)SPONSOR; MAXSIZE = 60

Occurrence: Type 1 and 3 records

Sponsor: The names of funding agencies are listed in free text. It is not possible to query on this element although there are situations in which it would be desirable to be able to retrieve all studies funded by a single agency. Therefore, in the event of a file revision, consideration should be given to making SPONSOR a coded, inverted element. The maximum size permits output on one line by a teletype.

20)PI; MAXSIZE = 60

Occurrence: Type 1 and 3 records

Principal Investigator: The names of principal investigators are entered in free text. The maximum size limitation permits output on one line by a teletype.

21)REMARKS; MAXSIZE = 2000;TEXT

Occurrences: All record types

Remarks: Any amplifying or explanatory information is entered in free text. All occurrences of "see remarks" in any other elements must be explained here. Remarks generally include a brief description or abstract of the study, data file, or model, types of instruments used, survey line densities, etc. This element uses the text editing (TEXT) capability of the SHARP DMS which prevents the splitting of words between lines on output. Two thousand characters is the maximum size of an element allowed by SHARP.

22)SITES; MAXSIZE = 3;INTEGER

Occurrence: Type 1 records

Number of Sites: The number of separate sites at which data were collected for the study or data file is entered here. This element is designated an integer so that it can be used in mathematical calculations by the SHARP system.

23-28: These numbers have not been assigned to any elements. They were left open to allow for adding elements to the type 1 or type 2 record formats if necessary.

29)LATITUDE; MAXSIZE = 8;CHARS 1/2;RANGE = 00/90; CHARS 3/4; RANGE = 00/59;CHARS 5/6;RANGE = 00/59; CHAR 7; VALUES = N,S;INVERT;REPEAT

Occurrence: Type 2 records

Latitude: The latitude of the data collection site is entered in degrees, minutes, and seconds North or South.

The actual input size is seven characters, but a maximum size of eight is specified in the file definition so that latitude and longitude will have identical spacing on output. Several data checks ("range" and "value") are included in the definition to prevent the input of impossible latitudes. This element is inverted for use in queries. For sites covering a large area it is sometimes appropriate to enter coordinates for the vertices of a polygon outlining the area or for the endpoints of a length of shoreline; therefore, the element is repeating to allow the entry of multiple sets of coordinates.

30) LONGITUDE; SIZE = 8;CHARS 1/3;RANGE = 000/180;CHARS 4/5; RANGE = 00/59;CHARS 6/7;RANGE = 00/59;CHAR 8;VALUES = E,W;INVERT;REPEAT

Occurrence: Type 2 records

Longitude: The longitude of the site is entered in degrees, minutes and seconds east or west. This element is similar to latitude (see element 29), being inverted and repeating and having range and value checks to prevent erroneous inputs.

31) AREA; MAXSIZE = 10;NUMERIC;CHAR 1;VALUES = 1,3,5, or 7; REPEAT;INVERT

Occurrence: Type 2 records

Area: The World Meteorological Organization (WMO) area code is entered here. This is a numeric code derived from latitude and longitude which can be used to designate areas as large as a ten degree square and as small as a one minute square. When the file was designed, the WMO code was envisioned as the primary

location designator for use in queries, but it proved to be cumbersome when the area to be searched was anything other than a 1-minute, 10-minute, 1-degree, or 10-degree square. Therefore latitude and longitude are used almost exclusively, and area is retained only for possible future use.

32)COUNTRY; SIZE = 2;ALPHAB;INVERT;CODED;DECSIZE = 25
Occurrence: Type 2 records

Country: A two-letter code for the country in which the site is located is entered here. This element is coded to facilitate input and querying. The codes used are those used by the Department of Defense.

33)OCEAN; SIZE = 3;ALPHAB;INVERT;CODED;DECSIZE = 25
Occurrence: Type 2 records

Ocean: A three-letter code for the body of water nearest to the site is entered here. It is coded to facilitate input and querying.

34)AXSHORE; SIZE = 1;RANGE 1/3;REPEAT;INVERT;CODED
Occurrence: Type 3 and 4 records

Across-the-shore: The location (onshore, nearshore, offshore) of the observation site on a transect perpendicular to the shoreline is entered. The element is repeating in case measurements were made in more than one zone. It is coded to facilitate input and querying. This element was included for possible use in conjunction with Dolan's and Hayden's classification of coastal environments which is based upon the organization of attributes across the coast and along the coast.

35)DEPTH; MAXSIZE = 3;INTEGER

Occurrence: Type 2 records

Depth: The depth at the observation site is entered to the nearest whole meter. This element is designated an integer so that it can be used in mathematical calculations by the SHARP DMS. No use of this capability has been made but it could be used to determine the average depth of a set of wave gauges, for instance. The maximum size is three digits because we are concerned mainly with shallow water coastal sites.

36)PLACE; MAXSIZE = 60

Occurrence: Type 2 and 3 records

Place Name: The name of the town or geographical feature nearest to the site is entered in free text. The maximum size of sixty characters permits output on one line by a teletype.

37)SITE; MAXSIZE = 60

Occurrence: Type 2 and 3 records

Site Description: Amplifying information on the observation site is entered in free text. This should be a refinement of the location given in element 36.

38)STATUS; SIZE = 1;RANGE = 1/4;INVERT;CODED;DECSIZE = 20

Occurrence: Type 2 records

Status: This element gives the status of observations at the site - active, temporarily inactive, discontinued, or unknown. It is coded for uniformity, ease of input, and querying

39)PERIOD/NO; MAXSIZE = 9;NUMERIC;REPEAT
Occurrence: Type 2 records

Period Number: This is a housekeeping element used in conjunction with element 44 to relate dates of operation to modes and methods of observation. A period number is entered here for each set of dates entered in elements 40 and 41. The period numbers start at one and increase sequentially (1,2,3,4, etc.). Usually only one character is required per entry but a maximum size of nine is specified for spacing purposes on output.

40)STARTDATE; MAXSIZE = 6;NUMERIC;REPEAT;INVERT
Occurrence: Type 2 records

Starting Date: Starting dates are entered for each period of observation at the site. The input format is two digits each for the year, month, and day in that order. The SHARP DMS has a routine, keyed by element names ending in DATE, which outputs dates in day, month (3-letter abbreviation), year format. This element is inverted for use in queries.

41)STOP-DATE; MAXSIZE = 6;NUMERIC;REPEAT;INVERT
Occurrence: Type 2 records

Stop Date: Ending dates are entered for each period of observation at the site. If the site is active (observations are continuing), no end date is entered for the last or current period of operation. See element 40 for a description of input and output formats. This element is inverted for use in queries.

42)LENGTH/YR; MAXSIZE = 8;REAL;DEC = 2;REPEAT;INVERT

Occurrence: Type 2 records

Length in Years: For each period of observation (element 39) and set of dates (elements 40 and 41), the length of that period (STOP-DATE - START-DATE) is entered. If the site is currently active, the duration of observations up to the time of record input is entered. This element is designated "real" so that it can be used in mathematical calculations by the SHARP DMS. The element definition specifies two decimal places (DEC = 2) so that the duration must be entered in years to the nearest hundredth. The decimal point may be omitted on input and the system will supply one. Most entries require only four or less characters but a maximum size of eight is specified to provide spacing on output. This element is inverted for use in queries.

43)DATA-GAPS; MAXSIZE = 1;NUMERIC;REPEAT;INVERT;CODED;DECSIZE=9

Occurrence: Type 2 records

Gaps in Data Record: The percentage of gaps in the data is entered for each period of observations. This percentage is equal to 100% times the actual number of good data points or records divided by the scheduled number. This element is coded for uniformity and inverted for use in queries.

44)PERIODS; MAXSIZE = 11;REPEAT

Occurrence: Type 2 records

Periods: This is a housekeeping element used in conjunction with element 39 to relate operational

information (dates, length, and gaps) to modes and methods of observation (frequency, method, and object) entered in elements 45-49. Each set of entries in elements 40-43 represents one period of operation. Element 39 assigns a serial number (1,2,3, etc.) to each period. Each set of entries in 45-49 represents one mode of observation. Element 44 gives the numbers of the operational periods that apply to each mode of observation. For example if 40-43 define four periods of operation and 45-49 describe three modes or objects of observation, then 39 will assign numbers 1,2,3, and 4 to the four periods, and element 44 could ascribe periods 1-3 to the first two modes of observation and 4 to the third mode. The definition of element 44 specifies a maximum size of eleven characters most of which are for spacing on output. Elements 44-47 are all designed to use 20 spaces per entry on output. This is done by adjusting the maximum entry sizes to compensate for differences in the sizes of the element names.

45)DATAFREQ; MAXSIZE = 10;REPEAT
Occurrence: Type 2 records

Data Frequency: The frequency at which the data are recorded is entered in free format. This element is used mainly for recording digitizing frequencies. See element 47 for an example.

46)RCDLENGTH; MAXSIZE = 9;REPEAT
Occurrence: Type 2 records

Record Length: The length of the data records is entered in free format. This is usually the length of time during which data are recorded during one observation. See element 47 for an example.

47)RCD-FREQ; MAXSIZE = 10;REPEAT

Occurrence: Type 2 records

Record Frequency: The frequency of observations or data records is entered in free format. Elements 45, 46, and 47 are designed to handle the case of an analog gauge signal that is digitized at discrete intervals for a certain length of time every so many hours or days. For example, wave gauge signals are typically digitized at 1/4 or 1/2 second intervals (DATAFREQ) for 17 minutes (RCDLENGTH) every three to six hours (RCD-FREQ). Most types of observations do not require all three elements. In the case of National Ocean Survey tide gauges which operate continuously, recording one data point every six minutes, DATAFREQ would be "10/HR" and RCD-FREQ could be "continuous" or it could be omitted along with RCDLENGTH. Another example is the case of daily beach surveys for which RCD-FREQ is "1/day" or "daily" and elements 45 and 46 are omitted.

48)VARIABLE; MAXSIZE = 4;NUMERIC;REPEAT;INVERT;CODED;DEC-SIZE = 19

Occurrence: Type 2 and 3 records

Variable: A four-digit code is entered for each variable measured. The first two digits of the code are the same as the parameter code (see element 7). The variables are subsets of the parameters; they specify in detail what attributes of the parameters are actually measured or observed. For example the variables "wave height," "wave period," and "breaker angle" are all measurable attributes of the parameter "waves." Under

the output report format designed for use with the SHARP DMS, only six variables can be output in one type 2 record. If more than six variables are measured at a single site, we usually input more than one type 2 record for that site. This element is coded for ease of input and uniformity and inverted for use in queries.

49)METHOD; MAXSIZE = 5;NUMERIC;REPEAT;CODED;DECSIZE = 20
Occurrence: Type 2 records

Method: A five-digit code is entered for the method used to measure each variable listed in element 48. The first two digits of the method code are the same as the parameter code (see element 7). Methods which apply to more than one parameter will have a separate code for each parameter. The variable and method codes are cross referenced to the parameter codes, so that having found the correct parameter code in a relatively small coding table, the coder then has to search only a portion of the large variable and method coding tables. To eliminate confusion between method and variable codes, the former were made one digit longer. This element is coded for uniformity and ease of input.

50)RCD-TYPE; SIZE = 1;RANGE = 1/3;INVERT;CODED
Occurrence: Type 2 records

Record Type: A one-digit code for record type (primary, secondary, or complementary) is entered. The determination of record type is a somewhat subjective process based on the parameters being measured and the

time duration of the observations. The parameters that we have considered "primary" are waves, wind, tide, currents, bathymetry, sediments, and beach morphology. Records containing these parameters are classified as "primary" and all others are "secondary," unless the duration of the observations is so short that we consider the data to have very little statistical or predictive value by themselves. Records of short duration are coded as "complementary" because the data may be of value if used to complement another data set from a different source. The dividing line between primary or secondary and complementary depends on the time variability of the parameter under consideration. For highly variable parameters such as waves and wind, observations lasting less than one year are considered complementary. When both primary and secondary parameters are included in one Type 2 record, the record is given the highest applicable classification. Our original procedure was to input a separate Type 2 record for each primary parameter observed at a site, but this resulted in large numbers of nearly duplicate records. We now put all parameters together except when the limitation of six variables per record (see element 48) requires additional records, in which case we try to group primary and secondary parameters into separate records.

51-60: These numbers have not been assigned to any elements. They were left open to allow for adding elements to the Type 2 or Type 3 record formats if necessary.

61)MODEL-TYP; MAXSIZE = 2;NUMERIC;INVERT;CODED;DECSIZE = 23
Occurrence: Type 3 records

Model Type: A one- or two-digit code is entered for the type of model (numerical, simulation, statistical, graphic, etc.). This element is coded for ease of input and uniformity and is inverted for use in queries. The decoded size of 23 characters provides desired spacing on output.

62)HRDWR-TYP; MAXSIZE = 2;NUMERIC;INVERT;CODED;DECSIZE = 23
Occurrence: Type 3 records

Hardware Type: A one- or two-digit code is entered for the type of hardware (digital, analog, hybrid, not applicable, etc.) used to run the model. This element is coded for uniformity and ease of input and is inverted for use in queries. The maximum decoded size of 23 characters provides desired spacing on output.

63)COMPUTER; MAXSIZE = 60;REPEAT
Occurrence: Type 3 records

Computer: The names and model numbers of computers on which the model has run or is running are entered in free text. The maximum size of 60 allows each entry to be output by teletype on one line. The element is repeating so that multiple entries can be input and multiple lines output.

64)SORC-LANG; MAXSIZE = 2;REPEAT;INVERT;CODED;DECSIZE = 23
Occurrence: Type 3 records

Source Language: A one- or two-digit code is entered for each computer language in which the model program is available. This element is coded for uniformity and ease of input and is inverted for use in queries. The maximum decoded size of 23 characters provides desired spacing on output.

65)OUT-MODE; MAXSIZE = 2;REPEAT;INVERT;CODED;DECSIZE = 23
Occurrence: Type 3 records

Output Mode: A one- or two-digit code is entered for each form of output (line printer, CRT display, etc.) available. This element is coded for uniformity and ease of input and is inverted for use in queries. The maximum decoded size of 23 characters provides desired spacing on output.

66)USABILITY; MAXSIZE = 2;REPEAT;INVERT;CODED;DECSIZE = 30
Occurrence: Type 3 records

Usability: A one- or two-digit code is entered for each level of usability that pertains to the model. The usability levels are intended to indicate the ease or difficulty with which the model can be put into operation. Each level is described by a word or phrase (untested, requires some programming, in use operationally, etc.). No guidelines have been established for determining usability; this is a subjective process based on the experience and intuition of the analyst. We do not test each model. This element is coded for uniformity and ease of input and is inverted for use in queries.

67)TIME-STEP; MAXSIZE = 23

Occurrence: Type 3 records

Time-step: The best single time-step or range of time-steps for use in the model is entered in free format. Typical entries could be: 3-5 hours; hours-days, etc. The maximum size of 23 characters provides desired spacing on output.

68)SPAC-SCAL; MAXSIZE = 23

Occurrence: Type 3 records

Space Scale: The range of grid spacings of maximum utility in the model is entered in free format. Typical entries might be: 10-100 meters; 0.1-1.0 km; etc. The maximum size of 23 characters provides desired spacing on output.

69)IN-GRID; MAXSIZE = 25

Occurrence: Type 3 records

Input Grid: The number of dimensions (one-dimensional, two-dimensional, etc.) of the input grid is entered in free format. The input grid defines the locations of the points for which initial data values are supplied to the model. For example, some models require initial bathymetric data in a two dimensional array of points. The maximum size provides desired spacing on output.

70)IN-AXES; MAXSIZE = 25;REPEAT

Occurrence: Type 3 records

Input Axes: The name or orientation (alongshore, north-south, etc.) of each axis of the input grid is entered

in free format. See element 69 for an explanation of the input grid. The maximum size provides desired spacing on output.

71) IN-PATTRN; MAXSIZE = 23
Occurrence: Type 3 records

Input Grid Pattern: The pattern (rectangular, triangular, etc.) of the input grid is entered in free format. See element 69 for an explanation of the input grid. The maximum size provides desired spacing on output.

72) IN-VARIBL; MAXSIZE = 23;REPEAT
Occurrence: Type 3 records

Input Variables: The name of each type of initial data value supplied to the model is entered in free format. The input variables are data that may be changed by the model during a run. The maximum size provides desired spacing on output.

73) IN-CONST; MAXSIZE = 24;REPEAT
Occurrence: Type 3 records

Input Constants: The name of each constant value supplied to the model is entered in free format. Input constants are not changed by the model during a run but may be changed by the operator during or between runs.

Elements 74-78 are identical to 69-73 respectively except that the information entered applies to output rather than input.

74)OUT-GRID; MAXSIZE = 25

Occurrence: Type 3 records

Output Grid: The number of dimensions of the output grid is entered in free format. The output grid defines the locations of the points for which data values are supplied by the model. The maximum size provides desired spacing on output.

75)OUT-AXES; MAXSIZE = 25;REPEAT

Occurrence: Type 3 records

Output Axes: The name or orientation of each axis of the output grid is entered in free format. See element 74 for an explanation of the output grid. The maximum size provides desired spacing on output.

76)OUT-PATRN; MAXSIZE = 23

Occurrence: Type 3 records

Output Grid Pattern: The pattern of the output grid is entered in free format. See element 74 for an explanation of the output grid. The maximum size provides desired spacing on output.

77)OUT-VARBL; MAXSIZE = 23;REPEAT

Occurrence: Type 3 records

Output Variables: The name of each type of data supplied by the model is entered in free format. These usually include the input variables (see element 72) altered by the model plus any new types of data generated by the model. The maximum size provides desired spacing on output.

78)OUT-CONST; MAXSIZE = 23;REPEAT
Occurrence: Type 3 records

Output Constants: The name of each constant output by the model is entered in free format. These will normally be the same as the input constants. The maximum size provides desired spacing on output.

79)CALIBRATN; MAXSIZE = 1500;TEXT
Occurrence: Type 3 records

Calibration Remarks: A brief description of the calibration requirements and procedures for the model is entered in free text. This element uses the text editing (TEXT) capability of the SHARP DMS which prevents the splitting of words between lines on output.

Tutorial Program

The two methods of entering the information system are the tutorial and the advanced modes. The tutorial search mode was programmed specifically for UVAIS under SHARP. It provides an easy means of using the UVAIS system for the novice user. Through a series of questions, the tutorial guides the user in the construction of a query based on parameter, location, and status of data collection. The system uses these criteria in a file search, reports the number of hits to the user, and asks where the user would like his output printed. It is necessary only that the user know the latitude and longitude of his search area before beginning a tutorial run; the tutorial provides all necessary instructions during the rest of the session.

Among the available choices in the tutorial is receiving the "Information Section"; this option is not available in the advanced mode. The Information Section provides background information for users who are not familiar with the literature and data collection methods of a particular parameter. At present, this section is available only for waves, tides, beach characteristics, bathymetry, and wind. It contains a methods reference describing instruments and techniques most frequently used to measure the parameter and a personal reference listing recognized experts in the field. It also references other data indices which may be of some assistance and lists key publications.

Program REFORMAT

REFORMAT is a fortran program designed to accomplish the first step in reformatting the input data cards for SHARP in the event that UVAIS is transferred to some other DMS. This program can read the SHARP input decks, decipher the SHARP input format, and separate out each individual data element and each data entry for repeating elements. It records the record identification number, element number, and entry size for each entry and also the number of each entry in a repeating element. If a new DMS is chosen, it should be relatively easy to write a program that will take the output from REFORMAT and put it into the proper format for input to the new system. However, it may be even simpler to output the data in the new format directly from the UVAIS file in SHARP.

In any case, REFORMAT has proven to be a useful tool in the constant battle to detect errors in format and data prior to input. The program is designed to flag certain common but unobtrusive format errors with error messages. In addition, the clean output (one element per line) of REFORMAT is much easier to scan for bad data since it avoids the multiple elements per line and elements split between lines common to a simple listing of the input deck. A listing of REFORMAT with sample input and output is contained in the appendices.

APPENDICES

APPENDIX A

Information Forms

Type 1 Record - Common Data

Type 2 Record - Site Data

Type 3 Record - Model Data

TYPE 1 RECORD - COMMON DATA

Study/Data file name:

RECORD:____________

Type 2 records:_____

No. of sites:______

Information Date:

Study type: 1-site specific; 2-data summary; 3-time-series; 4-synoptic scale; 5-model

Data-type: 1-real; 2-synthetic; 3-both; 4-see remarks

Medium:

Availability:

Analyses: 1-data are analyzed; 2-not analyzed; 3-unknown

Parameter:

Contact (name, address, telephone):

Publications:

Sources:

Principal Investigator:

Sponsor:

Remarks(description of study, purpose, gage types, analyses, data quality, etc):

TYPE 2 RECORD - SITE DATA RECORD:__________

Parameter:

Latitude:

Longitude:

Area (WMO) Code

Country: Ocean: Depth:

Location across-the-shoreline: 1-onshore; 2-nearshore; 3-offshore

Place Name:

Site Description:

Status: 0-unknown; 1-active; 2-temp. inactive; 3-discontinued

Period No.:	1	2	3	4	5
Start date:					
Stop date:					
Gaps (%):					

Periods:

Digitizing frequency:

Record length:

Record frequency:

Variables measured:

Methods of meas.:

Record type: 1-primary; 2-secondary; 3-complementary

Remarks (any amplifying or clarifying information applying to this site and not included in the type 1 remarks):

MODEL CODING SHEET

Model Name:________________________ Record:____________

Information Date:____________ Model type:____________

Hardware type:________________ Output mode:____________

Availability:____

Parameters:_____________________ Variables:____________

Contact (name, address, telephone):

Publications:

Sources:

Principal Investigator:

Sponsor:

Remarks (description of study, purpose, gage types, analyses, data quality, etc):

Calibration requirements:

Usability:

Location across-the-shoreline: 1-onshore; 2-nearshore; 3-offshore

Place Name :

Site Description:

Time scale:

Computer name:

Source Language:

Spatial Scale:

Inputs:	**Outputs:**
Grid dimension: ______	________
Names: ________________	________
________________	________
________________	________
Pattern: ______________	________
Variables: ____________	________
____________	________
____________	________
Parameters: ___________	________
___________	________
___________	________
___________	________
___________	________

APPENDIX B

UVAIS1 Data Definition

```
ID UVAIS1
0)RCDID;MAXSIZE=8;CHARS 1/4;NUMERIC;CHAR 5;SPACES OR VALUE=-;CHARS 6/8;S
PACES OR NUMERIC;INVERT
2)PROCDATE;MAXSIZE=6;INVERT
3)INFODATE;MAXSIZE=4;CHARS1/2;RANGE=00/99;CHARS 3/4;SPACES OR RANGE=CO/1
2
4)STUDY;MAXSIZE=60
5)STUDY-TYPE;SIZE=1;RANGE=1/4;REPEAT;INVERT;CODED;DECSIZE=16
6)DATA-TYPE;SIZE=1;RANGE=1/4;INVERT;CODED;DECSIZE=18
7)PARAMETER;SIZE=2;NUMERIC;REPEAT;INVERT;CODED;DECSIZE=19
8)MEDIUM;SIZE=1;NUMERIC;REPEAT;CODED;DECSIZE=20
9)DATA-AVAL; SIZE=1;NUMERIC;REPEAT;CODED;DECSIZE=30
10)ANALYSES;SIZE=1;RANGE=1/3;INVERT;CODED;DECSIZE=36
11)TYP2RCDS;MAXSIZE=3;INTEGER
12)CONTACT;MAXSIZE=60
13)CONINST;MAXSIZE=60
14)CONADD;MAXSIZE=60
15)CONSTAT;MAXSIZE=60
16)TELEPHONE;MAXSIZE=13
17)PUBLICATNS;MAXSIZE=60;REPEAT
18)SOURCES;MAXSIZE=60;REPEAT
19)SPONSOR;MAXSIZE=60
20)PI;MAXSIZE=60
21)REMARKS;MAXSIZE=2000;TEXT
22)SITES;MAXSIZE=3;INTEGER
29)LATITUDE;MAXSIZE=8;CHARS 1/2;RANGE=00/90;CHARS 3/4;RANGE=00/59;
   CHARS 5/6; RANGE=00/59; CHAR 7; VALUES=N,S; INVERT; REPEAT
30)LONGITUD;  SIZE=8; CHARS 1/3; RANGE=000/180; CHARS 4/5; RANGE=00/59;
   CHARS 6/7; RANGE=00/59; CHAR 8; VALUES=E,W; INVERT; REPEAT
31)AREA;MAXSIZE=10;NUMERIC;CHAR 1;VALUES=1,3,5, OR 7;REPEAT;INVERT
32)COUNTRY;SIZE=2;ALPHAB;INVERT;CODED;DECSIZE=25
33)OCEAN;  SIZE=3;ALPHAB;INVERT;CODED;DECSIZE=25
34)AXSHOR;SIZE=1;RANGE=1/3;REPEAT;INVERT;CODED;DECSIZE=9
35)DEPTH;MAXSIZE=3;INTEGER
36)PLACE;MAXSIZE=60
37)SITE;MAXSIZE=60
38)STATUS;SIZE=1;NUMERIC;INVERT;CODED;DECSIZE=20
39) PERIOD/NO; MAXSIZE=9; NUMERIC; REPEAT
40)STARTDATE;MAXSIZE=6;REPEAT;INVERT
41) STOP-DATE; MAXSIZE=6; NUMERIC; REPEAT; INVERT
42) LENGTH/YR; MAXSIZE=8; REAL; DEC=2; REPEAT; INVERT
43) DATA-GAPS; MAXSIZE=1; NUMERIC; REPEAT; INVERT; CODED;DECSIZE=9
44) PERIODS; MAXSIZE=11; REPEAT
45) DATAFREQ; MAXSIZE=10; REPEAT
46) RCDLENGTH; MAXSIZE=9; REPEAT
47) RCD-FREQ; MAXSIZE=10; REPEAT
48)VARIABLE;MAXSIZE=4;NUMERIC;REPEAT;INVERT;CODED;DECSIZE=19
49)METHOD;MAXSIZE=5;NUMERIC;REPEAT;CODED;DECSIZE=20
50)RCD-TYPE;SIZE=1;RANGE=1/3;INVERT;CODED;DECSIZE=13
61)MODEL-TYP;MAXSIZE=2;NUMERIC;INVERT;CODED;DECSIZE=23
62)HRDWR-TYP;MAXSIZE=2;NUMERIC;INVERT;CODED;DECSIZE=23
63)COMPUTER;MAXSIZE=60;REPEAT
64)SORC-LANG;MAXSIZE=2;REPEAT;INVERT;CODED;DECSIZE=23
65)OUT-MODE; MAXSIZE=2;REPEAT;INVERT;CODED;DECSIZE=23
66)USABILITY;MAXSIZE=2;REPEAT;INVERT;CODED;DECSIZE=30
67)TIME-STEP;MAXSIZE=23
68)SPAC-SCAL;MAXSIZE=23
69)IN-GRID;MAXSIZE=25
70)IN-AXES;MAXSIZE=25;REPEAT
71)IN-PATTRN;MAXSIZE=23
72)IN-VARIBL;MAXSIZE=23;REPEAT
73)IN-CONST;MAXSIZE=24;REPEAT
74)OUT-GRID;MAXSIZE=25
75)OUT-AXES;MAXSIZE=25;REPEAT
76)OUT-PATRN;MAXSIZE=23
77)OUT-VARBL;MAXSIZE=23;REPEAT
78)OUT-CONST;MAXSIZE=23;REPEAT
79)CALIBRATN;MAXSIZE=1500;TEXT
RELATIONS
SYNONYM STUDY=MODEL
SYNONYM DATA-AVAL=AVALBILTY, ACCESS
SYNONYM PLACE=LOCATION
SYNONYM CONINST=INSTITUTN
SYNONYM CONADD=STREET
SYNONYM CONSTAT=CITY/STATE
```

APPENDIX C

UVAIS1 Report Definitions and Sample Outputs

Report TP1 and Output

Report TP2 and Output

Report RCO and Output

Report MOD and Output

```
REPORT TP1
MHEAD = $GENERAL INFORMATION ON DATA COLLECTION PROGRAMS$
LINE 1= RCDID,N
LINE 2= STUDY
LINE 3= ALL SPACES
LINE 4 = STUDY-TYPE,N, DATA-TYPE,N, SITES,N
LINE 5 = PARAMETER, N, PARAMETER,PARAMETER
LINE 6 = PARAMETER, N, PARAMETER,PARAMETER
LINE 7 = PARAMETER, N, PARAMETER,PARAMETER
LINE 8= ALL SPACES
LINE 9 = MEDIUM,N, MEDIUM,MEDIUM
LINE 10= DATA-AVAL,N
LINE 11= DATA-AVAL,N
LINE 12 = ALL SPACES
LINE 20 = SPONSOR,N
LINE 21 = PI,N
LINE 22 = ALL SPACES
LINE 23 = CONTACT,N
LINE 24 = CONINST
LINE 25 = CONADD
LINE 26 = CONSTAT
LINE 27 = TELEPHONE,N
LINE 28 = ALL SPACES
LINE 30 = PUBLICATNS,N
LINE 31 = PUBLICATNS,N
LINE 32 = PUBLICATNS,N
LINE 33 = PUBLICATNS,N
LINE 34 = PUBLICATNS,N
LINE 35 = PUBLICATNS,N
LINE 36 = PUBLICATNS,N
LINE 37 = PUBLICATNS,N
LINE 38 = PUBLICATNS,N
LINE 39 = PUBLICATNS,N
LINE 40 = PUBLICATNS,N
LINE 41 = PUBLICATNS,N
LINE 42 = PUBLICATNS,N
LINE 43 = PUBLICATNS,N
LINE 44 = PUBLICATNS,N
LINE 45 = PUBLICATNS,N
LINE 46 = PUBLICATNS,N
LINE 47 = PUBLICATNS,N
LINE 48 = PUBLICATNS,N
LINE 49 = ALL SPACES
LINE 50 = REMARKS,N,M
LINE 51 = ALL SPACES
LINE 52 = ALL $- $
PRINT TOTAL TYP2RCDS AND SITES
PRINT COUNT RCDID
```

GENERAL INFORMATION ON DATA COLLECTION PROGRAMS

REPORT TP1 CCR001 JUN 08 1978

RCDID: 0001
CERC WAVE GAUGE PROGRAM

STUDY-TYP: LONG TIME-SERIES DATA-TYPE: REAL SITES: 36
PARAMETER: WAVES

MEDIUM: MAGNETIC TAPE STRIP CHARTS
DATA-AVAL: COST OF RETRIEVAL/REPRODUCTION

SPONSOR: CERC
PI: HARRIS, D.L., CERC, FORT BELVOIR, VA.

CONTACT: OCEANOGRAPHY BRANCH
COASTAL ENGINEERING RESEARCH CENTER
KINGMAN BUILDING
FORT BELVOIR, VA. 22060, USA
TELEPHONE: 202-325-7399

PUBLICATN: DARLING, J.M. AND D.G. DUMM. 1967. THE WAVE RECORD PROGRAM
AT CERC. CERC MISC PAPER MP 1-67
THOMPSON, E.F., 1974. RESULTS OF THE CERC WAVE MEASUREMENT
PROGRAM. PROCEEDINGS INTERNATIONAL SYMPOSIUM ON OCEAN
WAVE MEASUREMENT AND ANALYSIS, V. 1:836-855. ASCE
THOMPSON, E.F., 1977. WAVE CLIMATE AT SELECTED LOCATIONS
ALONG U.S. COASTS. CERC TR 77-1.

REMARKS: SIGNIFICANT WAVE HEIGHT AND PERIOD AND SPECTRUM ANALYSES OF
THE DATA ARE DONE ROUTINELY. MANY OTHER PROGRAMS ARE AVAILABLE AT CERC
FOR SPECIAL ANALYSES. THE DATA ARE SUMMARIZED MONTHLY. THE QUALITY OF
INCOMING DATA IS RATED BY PROGRAMS WHICH CHECK FOR ERRORS CAUSED BY
GAUGE AND TRANSMISSION EQUIPMENT MALFUNCTIONS.

- -

*****TOTAL****

TYP2RCDS: 36
SITES: 36

****COUNT*****

RCDID: 1

```
REPORT TP2
MHEAD = $INFORMATION ON DATA COLLECTION SITES$
LINE 1 = RCDID,N
LINE 2 = COUNTRY,N, OCEAN,N
LINE  3 = LATITUDE,N,LATITUDE,LATITUDE,LATITUDE,LATITUDE,LATITUDE
LINE 4 = LONGITUD,N,LONGITUD,LONGITUD,LONGITUD,LONGITUD,LONGITUD
LINE 7 = ALL SPACES
LINE 8= PLACE
LINE 9= SITE
LINE 10= AXSHORE,N, DEPTH,N, STATUS,N
LINE 11= ALL SPACES
LINE 12= PERIOD/NO,N, PERIOD/NO, PERIOD/NO, PERIOD/NO, PERIOD/NO
LINE 13= STARTDATE,N, STARTDATE, STARTDATE, STARTDATE, STARTDATE
LINE 14= STOP-DATE,N, STOP-DATE, STOP-DATE, STOP-DATE, STOP-DATE
LINE 15= LENGTH/YR,N, LENGTH/YR, LENGTH/YR, LENGTH/YR, LENGTH/YR
LINE 16= DATA-GAPS,N, DATA-GAPS, DATA-GAPS, DATA-GAPS, DATA-GAPS
LINE 17= ALL SPACES
LINE 18= PERIOD/NO,N, PERIOD/NO
LINE 19= STARTDATE,N, STARTDATE
LINE 20= STOP-DATE,N, STOP-DATE
LINE 21= LENGTH/YR,N, LENGTH/YR
LINE 22= DATA-GAPS,N, DATA-GAPS
LINE 23= ALL SPACES
LINE 27= PERIODS,N,PERIODS,N, PERIODS,N
LINE 28= DATAFREQ,N,DATAFREQ,N, DATAFREQ,N
LINE 29= RCDLENGTH,N,RCDLENGTH,N, RCDLENGTH,N
LINE 30= RCD-FREQ,N,RCD-FREQ,N, RCD-FREQ,N
LINE 31= VARIABLE,N, VARIABLE, VARIABLE
LINE 32= METHOD,N, METHOD, METHOD
LINE 33= ALL SPACES
LINE 34= PERIODS,N,PERIODS,N, PERIODS,N
LINE 35= DATAFREQ,N,DATAFREQ,N, DATAFREQ,N
LINE 36= RCDLENGTH,N,RCDLENGTH,N, RCDLENGTH,N
LINE 37= RCD-FREQ,N,RCD-FREQ,N, RCD-FREQ,N
LINE 38= VARIABLE,N, VARIABLE, VARIABLE
LINE 39= METHOD,N, METHOD, METHOD
LINE 42= ALL SPACES
LINE 43= REMARKS,N,M
LINE 45= ALL $- $
PRINT COUNT RCDID


REPORT RCD
MHEAD = $RECORD, COUNTRY AND OCEAN LISTS
COL HEAD 1 = $RECORD ID$
COL HEAD 2 = $COUNTRY$
COL HEAD 3 = $OCEAN$
PRINT RCDID, COUNTRY, AND OCEAN
PRINT COUNT RCDID
```

INFORMATION ON DATA COLLECTION SITES

REPORT TP2 CCR002 JUN 08 1978

```
RCDID: 0001-018
COUNTRY: UNITED STATES              OCEAN: NORTH ATLANTIC
LATITUDE: 290900N
LONGITUD: 0805800W

DAYTONA BEACH, FLA., U.S.A.
SEAWARD END OF SUNGLOW FISHING PIER IN 8.5FT MLW AFTER 11/64
AXSHORE: NEARSHORE  DEPTH:   3  STATUS: DISCONTINUED

PERIOD/NO: 1          2
STARTDATE: FEB 24 54  NOV 08 64
STOP-DATE: MAY 20 57  JUL 74      JUL 74
LENGTH/YR:       3.25        9.67
DATA-GAPS: UNKNOWN    UNKNOWN

PERIODS: 1                     2
DATAFREQ: CONT.                4/SEC
RCDLENGTH: 7 MIN                20 MIN
RCD-FREQ: 6/DAY                4/DAY
VARIABLE: WAVE HEIGHT
METHOD: STEP RESISTANCE GAGE  PRESSURE GAGE

REMARKS: STEP RESISTANCE GAGE INSTALLED IN 13FT MLW ON 2/24/54.
REPLACED BY PRESSURE GAGE IN 1964.
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

****COUNT*****

RCDID: 1

RECORD, COUNTRY AND OCEAN LIST

EAST COAST BEACH MORPHOLOGY RECORDS, 41N TO 43N

REPORT RCO CCR001 JUN 08 1978

RECORD ID	COUNTRY	OCEAN
0002-006	UNITED STATES	NORTH ATLANTIC
0002-008	UNITED STATES	NORTH ATLANTIC
0002-016	UNITED STATES	NORTH ATLANTIC
0012-001	UNITED STATES	NORTH ATLANTIC
0012-002	UNITED STATES	NORTH ATLANTIC
0012-003	UNITED STATES	NORTH ATLANTIC
.	.	.
.	.	.
.	.	.
0098-005	UNITED STATES	NORTH ATLANTIC
0101-001	UNITED STATES	NORTH ATLANTIC
0102-001	UNITED STATES	NORTH ATLANTIC

****COUNT*****

72

```
REPORT MOD
MHEAD = $INFORMATION ON COASTAL AND SHELF MODELS$
LINE 1 = RCDID
LINE 2 = MODEL,N
LINE 3 = LOCATION,N
LINE 4 = SITE,N
LINE 5 = ALL SPACES
LINE 6 = COMPUTER,N
LINE 7 = COMPUTER,N
LINE 8 = MODEL-TYP,N, HRDWR-TYP,N
LINE 9 = SORC-LANG,N, OUT-MODE,N
LINE 10= SORC-LANG,N, OUT-MODE,N
LINE 11= USABILITY,N, STATUS,N
LINE 12= AVALBILTY,N, AVALBILTY
LINE 13= PARAMETER,N, PARAMETER, PARAMETER
LINE 14= PARAMETER,N, PARAMETER, PARAMETER
LINE 15= VARIABLE,N, VARIABLE, VARIABLE
LINE 16= VARIABLE,N, VARIABLE, VARIABLE
LINE 17= ALL SPACES
LINE 18= CONTACT,N
LINE 19= CONINST
LINE 20= CONADD
LINE 21= CONSTAT
LINE 22= TELEPHONE,N
LINE 23= ALL SPACES
LINE 24= SPONSOR,N
LINE 25= PI,N
LINE 26= PUBLICATN,N
LINE 27= PUBLICATN,N
LINE 28= PUBLICATN,N
LINE 29= PUBLICATN,N
LINE 30= PUBLICATN,N
LINE 31= PUBLICATN,N
LINE 32= PUBLICATN,N
LINE 33= PUBLICATN,N
LINE 34= PUBLICATN,N
LINE 35= PUBLICATN,N
LINE 36= PUBLICATN,N
LINE 37= PUBLICATN,N
LINE 38= PUBLICATN,N
LINE 39= PUBLICATN,N
LINE 40= PUBLICATN,N
LINE 41= ALL SPACES
LINE 42= TIME-STEP,N, SPAC-SCAL,N
LINE 43= IN-GRID,N, OUT-GRID,N
LINE 44= IN-AXES,N, OUT-AXES,N
LINE 45= IN-AXES,N, OUT-AXES,N
LINE 46= IN-AXES,N, OUT-AXES,N
LINE 47= IN-PATTRN,N, OUT-PATRN,N
LINE 48= IN-VARIBL,N, OUT-VARBL,N
LINE 49= IN-VARIBL,N, OUT-VARBL,N
LINE 50= IN-VARIBL,N, OUT-VARBL,N
LINE 51= IN-VARIBL,N, OUT-VARBL,N
LINE 52= IN-CONST,N, OUT-CONST,N
LINE 53= IN-CONST,N, OUT-CONST,N
LINE 54= IN-CONST,N, OUT-CONST,N
LINE 55= IN-CONST,N, OUT-CONST,N
LINE 56= ALL SPACES
LINE 57= CALIBRATN,N,M
LINE 58= ALL SPACES
LINE 59= REMARKS,N,M
```

INFORMATION ON COASTAL AND SHELF MODELS

REPORT MOD CCR003 JUN 08 1978

9999-001
MODEL: BAR SIMULATION MODEL

COMPUTER: CONTROL DATA CORP. CYBER 172
MODEL-TYP: SIMULATION HRDWR-TYP: ANALOG
SORC-LANG: FORTRAN OUT-MODE: LINE PRINTER
USABILITY: UNDOCUMENTED
AVALBILTY: COST OF RETRIEVAL/REPRODUCTION
PARAMETER: BATHYMETRY
VARIABLE: BATHYMETRY

CONTACT: WILSON N. FELDER
DEPT. OF ENVIRONMENTAL SCIENCES
UNIVERSITY OF VIRGINIA
CHARLOTTESVILLE, VA 22903
TELEPHONE: 804-924-7761

PI: FELDER
PUBLICATN: 1. FELDER, W.N., 1978. PHD DISSERTATION,
DEPT. OF ENVI. SCI., UNIV. OF VA.

TIME-STEP: HOURS-DAYS SPAC-SCAL: 1-100 METERS
IN-GRID: 2 DIMENSIONS OUT-GRID: SAME
IN-AXES: ALONGSHORE OUT-AXES: SAME
ACROSS THE SHORE
IN-PATTRN: RECTANGULAR OUT-PATRN: SAME
IN-VARIBL: DEPTH OUT-VARBL: DEPTH AT GRID POINTS
IN-CONST: GRID SQUARE DIMENSIONS
WAVE PERIOD AND ANGLE
DEEP WATER WAVE HEIGHT

CALIBRATN: MUST HAVE SAMPLE OF ORIGINAL AND FINAL BATHYMETRY AND INPUT DATA FOR THE INTERVENING PERIOD IN ORDER TO ESTABLISH VALUES FOR 3 CALIBRATION CONSTANTS.

REMARKS: THIS MODEL USES THE SEA BREEZE REFRACTION MODEL TO REFRACT INCOMING WAVES. THE WAVES CAUSE BOTTOM SEDIMENT TRANSPORT BETWEEN GRID SQUARES RESULTING IN THE SIMULATION OF BAR FORMATION. THE WAVE REFRACTION PATTERN IS ALTERED TO CONFORM TO BATHYMETRY CHANGES AFTER EACH TIME STEP.

APPENDIX D

Sharp Programs*

- Update
- Query
- Code Definition
- Report Definition

*Lines enclosed in brackets are either instructions (not part of the program) or simulated end-of-file cards. The latter should be replaced by actual 789 or 6789 cards.

1. SHARP Batch Update Program

```
PUKRUPD,CM70000,T1000,P4.
CHARGE,PUKR,W[redacted]2,CC,3.
MAP(OFF)
LIMIT,7000.
ROUTE,OUTPUT,DEF,DC=PR,TID=YO.
ATTACH(UPDLIB,ID=SHRP,MR=1)
LIBRARY(UPDLIB)
REQUEST,OUTDISC,*PF.
ATTACH(SISDISC,DATADEFFILE,ID=SHRP,MR=1)
FMCK.
CATALOG(OUTDISC,UVAOUTDISC,ID=PUKR,AC=[redacted])
ATTACH(DISPLAY,ID=SHRP,MR=1)
DISPLAY.
REQUEST,SH00101,*PF.
HSORT.
CATALOG(SH00101,UVASH00101,ID=PUKR,AC=[redacted])
REQUEST,SH00201,*PF.
REQUEST,COPY109,*PF.
ATTACH(DIRIN,UVADIR,ID=SHRP)
RENAME(DIRIN,,CY=2)
COPYBF(DIRIN,SH00201)
REWIND(SH00201)
DUPD.
REWIND(ZZZZZEF)
CATALOG(SH00201,UVADIR,ID=SHRP,AC=[redacted],CY=1)
REWIND(IN00109)
COPYCF(IN00109,COPY109)
CATALOG(COPY109,UVACOPY109,ID=PUKR,AC=[redacted])
ATTACH(INSM,ID=SHRP,MR=1)
REWIND(IN00109,INVTRAN)
FILE(IN00109,BT=C,RT=F,FL=88,MBL=640)
FILE(INVTRAN,BT=C,RT=F,FL=88,MBL=640)
LDSET(FILES=IN00109/INVTRAN)
SORTMRG(I=INSM)
REQUEST,IN00101,*PF.
ATTACH(INVIN,UVAINV,ID=SHRP)
RENAME(INVIN,,CY=2)
COPYBF(INVIN,IN00101)
REWIND(IN00101)
IN1.
CATALOG(IN00101,UVAINV,ID=SHRP,AC=[redacted],CY=1)
PURGE(OUTDISC)
PURGE(SH00101)
PURGE(COPY109)
PURGE(DIRIN)
PURGE(INVIN)
[7 8 9 CARD]
ID UVAIS1
[INSERT DATA INPUT DECK HERE]
$STOP
[6 7 8 9 CARD      END OF FILE]
```

2. SHARP Batch Query Program

```
PUKRQRY,CM70000,T400,P4.                                    O-U, REA
CHARGE,PUKR,[redacted],CC,B.
MAP,OFF.
LIMIT,7000.
ROUTE,OUTPUT,DEF,DC=PR,TID=YO.
SWITCH,3.
ATTACH(TESTLIB,ID=CACP,MR=1)
ATTACH(RETLIB,ID=SHRP,MR=1)
LIBRARY(TESTLIB,RETLIB)
ATTACH(REPDEF3,DATADEFFILE,ID=SHRP,MR=1)
FILE(TAPE7,BFS=128)
FILE(TAPE8,BFS=128)
FILE(REPDEF3,BFS=1536)
LT.
SCRN.
ATTACH(INV001,UVAINV,ID=SHRP,MR=1)
FILE(QTM001,BFS=128)
FILE(INV001,BFS=1536)
FILE(PHRM001,BFS=256)
FILE(PHRM002,BFS=256)
FILE(PHRM003,BFS=256)
FILE(PHRM004,BFS=256)
FILE(PHRM005,BFS=256)
FILE(PHRM006,BFS=256)
FILE(PHRM007,BFS=256)
FILE(PHRM008,BFS=256)
LDSET(FILES=QTM001/INV001/PHRM001/PHRM002/PHRM003/PHRM004/PHRM005)
LDSET(FILES=PHRM006/PHRM007/PHRM008)
PHRMM.
RETURN,INV001.
ATTACH(DIRECMF,UVADIR,ID=SHRP,MR=1)
ATTACH(CODEF,UVACODEF,ID=SHRP,MR=1)
RT80.
RT9.
RT100.
RETURN,DIRECMF.
FILE(REPDEF3,BFS=1536)
FILE(RT01001,BFS=1280)
FILE(REPGEN1,BFS=1280)
REPGN.
EXIT(U)
REWIND,TAPE7.
COPYSBF,TAPE7.
REWIND,REPGEN1.
COPYCF,REPGEN1,OUTPUT,999.
[7 8 9 CARD]
 ID UVAIS1
[INSERT QUERY CARDS HERE
 7 8 9 CARD              ]
```

Batch Query Program (continued)

```
INP(RT006C1)
OUT(OUTPUT1)
PRT(OUTPUT1,FMT=D)
XEQ.
INP(SHJ1001)
OUT(OUTPUT2)
PRT(OUTPUT2,FMT=D)
XEQ.
INP(RT01CC1)
OUT(OUTPUT3)
PRT(OUTPUT3,TTL=$RT01001$)
XEQ(FIN)
[6 7 8 9 CARD      END OF FILE]
```

3. SHARP Batch Code Definition Program

```
PUKRCOD,CM70000,T200,P4.
CHARGE,PUKR,W[redacted]2,CC,B.
MAP(OFF)
SWITCH,2.
ATTACH(UPD,TREELISTUPD,ID=SHRP,MR=1)
ATTACH(CODEF,UVACODEF,ID=SHRP)
ATTACH(REPDEF3,DATADEFFILE,ID=SHRP,RW=1)
COPYCR(INPUT,INP)
REWIND(INP)
COPYSBF(INP,OUTPUT)
UPD.
[7 8 9 CARD                                                  ]
[INSERT CONTEXT CARD FOLOWED BY NEW AND CHANGED CODES]
LIST ALL CODED IN UVAIS1;
EOJ;
[7 8 9 CARD                    ]
[6 7 8 9 CARD      END OF FILE]
```

4. SHARP Batch Report Definition Program

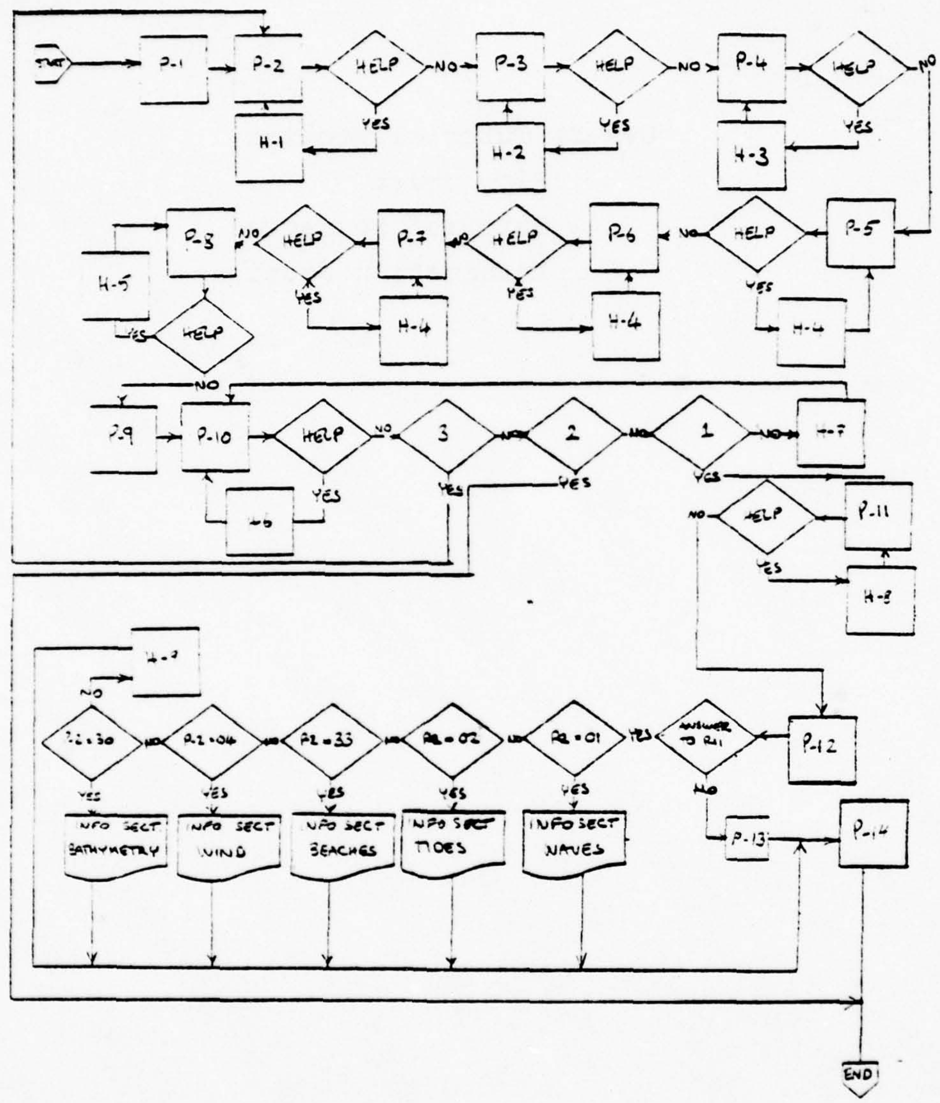
```
PUKRRDF,CM7000C,T100,P4.
CHARGE,PUKR,W[redacted]2,CC,B.
ATTACH(UPDLIB,ID=SHRP,MR=1)
LIBRARY(UPDLIB)
ATTACH(REPDEF3,DATADEFFILE,ID=SHRP,RW=1)
FILE(REPDEF3,BFS=1536)
REWIND(TERMINL)
REPDF.
[7 8 9 CARD                        ]
[INSERT REPORT DEFINITION DECK HERE]
[6 7 8 9 CARD      END OF FILE     ]
```

APPENDIX E

UVAIS1 Tutorial Program

- Flow Chart
- Tutorial Messages
- Information Sections

Flow Chart for UVAIS1 Tutorial Query Program



TUTORIAL MESSAGES - KEYED TO FLOW CHART

I. Standard Tutorial Responses

P-1 YOU HAVE SELECTED THE TUTORIAL QUERY MODE. YOU MAY QUERY ON A SEARCH PARAMETER FROM A SPECIFIED LIST. IF AT ANY TIME YOU REQUIRE ASSISTANCE OR MORE EXPLANATION WHILE ENTERING YOUR QUERY, TYPE THE WORD HELP. IF YOU DISCOVER THAT ONE OF THE VALUES WHICH YOU TYPED IS INCORRECT, JUST CONTINUE YOUR QUERY. AFTER YOUR QUERY HAS BEEN ENTERED, YOU WILL BE OFFERED AN OPPORTUNITY TO RETURN TO THE START AND CORRECT YOUR QUERY.

P-2 PARAMETER OF CONCERN OPTIONS (CHOOSE 1):

CODE	PARAMETER
01	WAVES
02	TIDES
04	WIND
30	BATHYMETRY
33	BEACH CHARACTERISTICS

ENTER APPROPRIATE CODE.

P-3 COUNTRY OF INTEREST (CHOOSE 1):

CN	CANADA
US	UNITED STATES

ENTER CODE.

P-4 OCEAN OF INTEREST (CHOOSE 1):

NAT	NORTH ATLANTIC
NPC	NORTH PACIFIC
GMX	GULF OF MEXICO
CBB	CARIBBEAN SEA
ARC	ARCTIC OCEAN

ENTER CODE.

P-5 THE SYSTEM WILL SEARCH FROM 1 TO 20 DEGREES AROUND YOUR LOCATION OF CONCERN; PLEASE ENTER NUMBER OF DEGREES.(2 DIGITS)

P-6 ENTER LATITUDE TO THE NEAREST WHOLE DEGREE.(2 DIGITS)

P-7 ENTER LONGITUDE TO THE NEAREST WHOLE DEGREE.(3 DIGITS)

P-8 TIME FRAME OF CONCERN (CHOOSE 1):

1. DATA COLLECTION IN PROGRESS AT TIME OF RECORD INPUT.
2. INCLUDE ALL RECORDS.

ENTER APPROPRIATE CODE.

P-9 YOU HAVE CHOSEN THE FOLLOWING CRITERIA:

```
PARAMETER                   WAVES
TIME FRAME                  ONGOING RECORDS
LOCATION                    NORTH ATLANTIC
                            CANADA

50N/065W                   50N/064W
        X                  X
                 X
        X                  X
49N/065W                   49N/064W
```

actual example

P-10 WHAT WOULD YOU LIKE TO DO (CHOOSE 1):

```
CODE        ACTION
  1.      RUN THE QUERY
  2.      QUIT
  3.      TRY AGAIN
```

ENTER CODE.

P-11 WOULD YOU LIKE THE INFORMATION SECTION ON YOUR CHOSEN PARAMETER? IT CONSISTS OF THREE SECTIONS: METHODS REFERENCE, PERSONAL REFERENCE, OTHER SOURCES TO CHECK.

ENTER YES OR NO.

P-12 YOUR QUERY WILL BE PROCESSED AFTER THE INFORMATION SECTION IS PRINTED. YOUR QUERY HITS WILL BE LISTED SEVERAL MINUTES AFTER THE INFORMATION SECTION.

P-13 NO

P-14 WE REQUEST THAT IF YOU HAVE MORE THAN 20 HITS, YOU SELECT BATCH PROCESSING. THIS WILL ROUTE YOUR OUTPUT TO A HIGHSPEED PRINTER, AND THE PRINTOUT WILL BE MAILED TO YOU.

SHARP IS A GENERALIZED DATA MANAGEMENT SYSTEM DEVELOPED AT THE DAVID TAYLOR NAVAL SHIP RESEARCH AND DEVELOPMENT CENTER IN CARDEROCK, MARYLAND. THE FOLLOWING QUESTION IS A PART OF THE NON-TUTORIAL SHARP SYSTEM.

II. Tutorial "HELP" Responses

H-1 A 'PARAMETER' IS SOME PHYSICAL VARIABLE BEING MEASURED. THE PERMISSIBLE PARAMETERS ARE LISTED UNDER 'PARAMETER'. CHOOSE ONE, THEN TYPE IN THE CORRESPONDING TWO DIGIT CODE LISTED OPPOSITE THAT PARAMETER UNDER 'CODE'.

H-2 YOUR SEARCH IS LIMITED GEOGRAPHICALLY TO A SINGLE COUNTRY. IF YOU ARE INTERESTED IN A BORDER AREA, PLEASE ENTER A SEPARATE QUERY FOR EACH COUNTRY.

H-3 YOUR SEARCH IS LIMITED GEOGRAPHICALLY TO A SINGLE OCEAN. IF YOU ARE INTERESTED IN MORE THAN ONE, PLEASE ENTER A SEPARATE QUERY FOR EACH.

H-4 THE SYSTEM WILL USE THE LATITUDE / LONGITUDE COORDINATES YOU WILL PROVIDE TO COMPUTE A SEARCH AREA. YOUR COORDINATES WILL BE USED AS THE CENTRAL POINT OF A SQUARE. FOR EXAMPLE:

```
YOU ENTER:  5 FOR DEGREE SEARCH
            29N FOR LATITUDE (YOU MUST ENTER 2 DIGITS)
            075W FOR LONGITUDE (YOU MUST ENTER 3 DIGITS)
THE SYSTEM WILL SEARCH THE AREA BOUNDED BY:

34N/80W                        34N/70W
    X                              X
                 X
    X                              X
24N/80W                        24N/70W
```

H-5 IF YOU CHOOSE OPTION 1, YOU WILL RECEIVE INFORMATION ONLY ON STUDIES THAT WERE ACTIVE AT THE TIME OF RECORD INPUT. OTHERWISE YOU WILL RECEIVE ALL RECORDS.

H-6 IF YOU SELECT OPTION NUMBER 1, YOUR QUERY WILL BE RUN AND YOU WILL RECEIVE A REPORT ON THOSE RECORDS WHICH SATISFY YOUR SEARCH CRITERIA,
IF YOU SELECT OPTION NUMBER 2, THE TUTORIAL PROGRAM WILL TERMINATE AND YOU WILL BE RETURNED TO THE SHARP SYSTEM.
IF YOU SELECT OPTION NUMBER 3, YOU WILL BE GIVEN AN OPPORTUNITY TO CHANGE YOUR QUERY, IN CASE YOU MADE AN ERROR.

H-7 YOU HAVE CHOSEN A PROHIBITED CODE FOR THIS QUESTION. PLEASE SELECT ANOTHER OPTION.

H-8 A DETAILED INFORMATION SECTION IS AVAILABLE, IT CONTAINS:
1, METHODS REFERENCE - A DESCRIPTION OF THE OPERATION AND CHARACTERISTICS OF METHODS USED TO MEASURE YOUR PARAMETER,
2, PERSONAL REFERENCE - A LIST OF PERSONS WHO ARE RECOGNIZED EXPERTS ON YOUR PARAMETER AND WHO MAY BE ABLE TO ASSIST WITH RESEARCH PROBLEMS.
3, OTHER SOURCES TO CHECK - A LIST OF OTHER DATA INDICES WHICH INCLUDE COASTAL INFORMATION.

H-9 YOU HAVE CHOSEN A PARAMETER FOR WHICH NO INFORMATION SECTION IS AVAILABLE.

WAVES INFORMATION SECTION

1. OTHER SOURCES TO CHECK:

TO GET THE MOST RECENT INFORMATION ON WAVE MEASUREMENT PROGRAMS, CONTACT:

ANDRE SZUWALSKI
COASTAL INFORMATION ANALYSIS CENTER
U.S. ARMY CORPS OF ENGINEERS
COASTAL ENGINEERING RESEARCH CENTER
KINGMAN BUILDING
FORT BELVOIR, VA. 22060
202-325-7386

NOAA DATA BUOY OFFICE
NATIONAL SPACE TECHNOLOGY LABORATORIES
NATIONAL OCEANOGRAPHIC AND ATMOSPHERIC ADMINISTRATION
BAY ST. LOUIS, MISSOURI 39520
601-688-2836

DR. J.R. WILSON
MARINE ENVIRONMENTAL DATA SERVICE
OCEAN AND AQUATIC AFFAIRS
DEPT. OF THE ENVIRONMENT
580 BOOTH ST., 7TH FLOOR
OTTAWA, ONTARIO, K1A 0H3 CANADA
ATTENTION: WAVE CLIMATE STUDY
613-995-2007

2. METHODS:

VISUAL OBSERVATIONS: WAVE DATA FROM SHIPS AT SEA AND SURF DATA ARE COMMONLY OBTAINED BY VISUAL OBSERVATIONS IN WHICH THE OBSERVER SIMPLY ESTIMATES THE HEIGHT, DIRECTION, AND PERIOD OF THE WAVES. A FIXED PILE OR OTHER OBJECT MAY BE USED AS A REFERENCE FOR HEIGHT ESTIMATES, AND WAVE PERIOD IS OBTAINED FROM THE TIMED PASSAGE OF 11 WAVE CRESTS. ASIDE FROM THESE AIDS, THE ACCURACY OF THE DATA DEPENDS UPON THE SKILL OF THE OBSERVER. INVESTIGATORS USING VISUAL DATA OBTAIN THE MOST STATISTICALLY VALID RESULTS BY ANALYZING LARGE NUMBERS OF OBSERVATIONS. SHIP OBSERVATIONS ARE BIASED TOWARD SMALLER WAVES BECAUSE SHIPS TRY TO AVOID STORMS. VISUAL ESTIMATES OF WAVE HEIGHT GENERALLY APPROXIMATE THE SIGNIFICANT WAVE HEIGHT.

STEP RESISTANCE AND STEP CAPACITANCE GAGES: THESE GAGES ARE COMPRISED OF A SERIES OF ELECTRICAL CONTACT POINTS INSTALLED AT REGULAR INTERVALS (0.2 FT FOR CERC GAGES) ON A STAFF WHICH IS MOUNTED VERTICALLY ON SOME FIXED STRUCTURE. THE WATER LEVEL IS DETERMINED FROM THE STEP-WISE VARYING ELECTRICAL SIGNAL WHICH DEPENDS ON THE NUMBER OF CONTACT POINTS THAT ARE SUBMERGED. THE MAXIMUM RESOLUTION OF THE GAGE IS THE DISTANCE BETWEEN CONTACTS.

PARALLEL WIRE INDUCTANCE GAGE: THIS GAGE CONSISTS OF TWO PARALLEL CONDUCTING WIRES MOUNTED VERIICALLY ON A STAFF. THE ELECTRICAL INDUCTANCE BETWEEN THE WIRES VARIES WITH THE AMOUNT OF SUBMERGENCE PROVIDING A CONTINUOUS MEASUREMENT OF WATER LEVEL.

PRESSURE GAGE: THERE ARE A NUMBER OF DIFFERENT TYPES OF TRANSDUCERS USED IN PRESSURE GAGES TO CONVERT WATER PRESSURE FLUCTUATIONS INTO ELECTRICAL SIGNALS. SOME USE SUCH INSTRUMENTS AS INDUCTANCE BRIDGES, STRAIN GAGES, POTENTIOMETERS ATTACHED TO BELLOWS, VIBRATING WIRES, AND THERMOCOUPLES. PRESSURE GAGES ARE USEFUL WHERE THERE IS NO STRUCTURE ON WHICH TO MOUNT A WAVE STAFF. HOWEVER THEY MUST BE PLACED IN RELATIVELY SHALLOW WATER (10 TO 20 METERS) BECAUSE OF THE ATTENUATION WITH DEPTH OF SURFACE WAVE EFFECTS.

ACCELEROMETER: VERTICAL ACCELEROMETERS MOUNTED IN BUOYS ARE USED TO MEASURE WAVE HEIGHT. THE ACCELEROMETER SENSES VERTICAL ACCELERATIONS CAUSED BY THE PASSAGE OF WAVES BENEATH THE BUOY. BY INTEGRATING THE ACCELERATION SIGNAL TWICE, VERTICAL DISPLACEMENT OF THE BUOY IS OBTAINED. ACCELEROMETER GAGES ARE COMMONLY USED IN DEEP WATER WHERE NO STRUCTURES ARE AVAILABLE. THEY ARE SUBJECT TO ERRORS CAUSED BY TILTING OF THE PLATFORM AND BY ITS INERTIA. THE DATAWELL WAVERIDER BUOY IS PROBABLY THE MOST USED ACCELEROMETER WAVE GAGE.

SONIC ECHO SOUNDER: DOWNWARD-LOOKING ECHO SOUNDERS MOUNTED ON ANCHORED FLOATING PLATFORMS AND UPWARD-LOOKING SONIC DEVICES ON SUBMERGED PLATFORMS ARE BOTH USED TO MEASURE WAVES. THE FORMER ARE SUBJECT TO ERRORS CAUSED BY TILT AND INERTIA OF THE PLATFORM. THE UPWARD-LOOKING GAGES SUFFER FROM BEAM-SPREADING ERROR.

HINDCASTING: VARIOUS TECHNIQUES HAVE BEEN DEVELOPED FOR PREDITING OR HINDCASTING WAVE CHARACTERISTICS FROM WEATHER DATA INCLUDING PRESSURE GRADIENTS, WIND SPEEDS, FETCH LENGTHS, ETC. THE MOST WELL-KNOWN METHOD IS PROBABLY THE S-M-B METHOD OF SVERDRUP, MUNK, AND BRETSCHNEIDER.

3. REFERENCES:

HARRIS, D.L., 1974. FINITE SPECTRUM ANALYSES OF WAVE RECORDS. CERC REPRINT 6-74 (AD A002-113/6-74).

IPPEN, A.T., EDITOR. ESTUARY AND COASTLINE HYDRODYNAMICS, 1966, MCGRAW-HILL BOOK CO., INC., NEW YORK

NEUMANN, G. AND W.J. PIERSON, 1966, PRINCIPLES OF PHYSICAL OCEANOGRAPHY, PRENTICE-HALL, ENGLEWOOD CLIFFS, N.J.

LAMB, H., HYDRODYNAMICS, 6TH ED., 1945, DOVER PUBLICATIONS, NEW YORK

4. PERSONAL REFERENCES:

WALTER H. MUNK
DIRECTOR INSTITUTE OF GEOPHYSICS AND PLANETARY PHYSICS
LA JOLLA, CA. 92037

D.L. HARRIS
COASTAL ENGINEERING RESEARCH CENTER
KINGMAN BUILDING
FORT BELVOIR, VA. 22060

DR. D.T. RESIO
WATERWAYS EXPERIMENT STATION
U.S. ARMY CORPS OF ENGINEERS
BOX 631
VICKSBURG, MISSISSIPPI 39180

TIDES INFORMATION SECTION

1. OTHER SOURCES TO CHECK:

NATIONAL OCEAN SURVEY SECONDARY TIDE STATIONS
CONTACT:
JIM HUBBARD
TIDES BRANCH, NOS, NOAA
ROCKVILLE, MD. 20852

2. PURPOSES OF TIDE OBSERVATIONS:

TIDE MEASUREMENTS ARE MADE BY THE NATIONAL OCEAN SURVEY TO ESTABLISH A UNIFORM LEVEL, OR DATUM PLANE, TO WHICH OBSERVED WATER DEPTHS CAN BE REFERRED, THE SOUNDINGS BEING TAKEN AT DIFFERENT STAGES OF THE TIDE DURING HYDROGRAPHIC SURVEYS. IN ADDITION TO SATISFYING THE CHARTING REQUIREMENTS OF THE BUREAU, TIDE MEASUREMENTS ALSO ARE MADE FOR THE FOLLOWING PURPOSES: A) TO DETERMINE MEAN SEA LEVEL AND OTHER TIDAL DATUM PLANES FOR SURVEYING AND ENGINEERING PURPOSES AND TO ESTABLISH A SYSTEM OF TIDAL BENCH MARKS TO WHICH THESE PLANES CAN BE REFERRED; B) TO PROVIDE DATA FOR TIDE AND CURRENT PREDICTIIONS AND PUBLICATION OF THIS DATA IN ANNUAL TIDE AND CURRENT TABLES; C) TO INVESTIGATE FLUCTUATIONS OF SEA LEVEL AND CRUSTAL MOVEMENTS OF THE EARTH; D) TO SUPPLY INFORMATION CONCERNING TIDAL CONDITIONS FOR ENGINEERING PROJECTS; E) TO PROVIDE PERTINENT DATA FOR SPECIAL STUDIES; AND F) TO FURNISH INFORMATION FOR LEGAL CASES REGARDING TIDAL BOUNDARIES-BOTH STATE AND FEDERAL-AND VARIOUS OTHER MARITIME INTERESTS. SELF-REGISTERING GAGES ALSO PROVIDE RECORDS OF NONPERIODIC CHANGES IN SEA LEVEL, SUCH AS, STORM SURGES AND TSUNAMIS OR SEISMIC SEA WAVES. THIS INFORMATION HAS CONTRIBUTED TO THE ESTABLISHMENT OF THE SEISMIC SEA-WAVE WARNING SYSTEM TO PREVENT LOSS OF LIFE AND PROPERTY IN EXPOSED AREAS.

TIDE STATIONS ARE CLASSIFIED AS CONTROL STATIONS AND SECONDARY STATIONS. CONTROL STATIONS ARE THOSE AT WHICH TIDE OBSERVATIONS ARE CONTINUED FOR A NUMBER OF YEARS TO DERIVE BASIC TIDAL DATA FOR THE LOCALITY. SECONDARY STATIONS ARE OPERATED ONLY FOR LIMITED PERIODS OF TIME TO OBTAIN TIDAL INFORMATION FOR A PARTICULAR PURPOSE.

3. METHODS:

A TIDE GAGE IS AN INSTRUMENT THAT IS USED TO MEASURE THE HEIGHT OF THE TIDE. TWO GENERAL TYPES OF GAGES ARE USED, NONREGISTERING AND SELF-REGISTERING. NONREGISTERING GAGES REQUIRE THE PRESENCE OF AN OBSERVER TO MEASURE AND RECORD THE HEIGHT OF THE TIDE. SELF-REGISTERING OR AUTOMATIC GAGES AUTOMATICALLY RECORD THE RISE AND FALL OF THE TIDE WHILE UNATTENDED.

NONREGISTERING GAGES INCLUDE THE TIDE STAFF, SOME TYPES OF FLOAT-OPERATED GAGES, AND THE ELECTRIC TAPE GAGE. SELF-REGISTERING GAGES INCLUDE A VARIETY OF TYPES, SOME OF WHICH RECORD THE RISE AND FALL OF THE TIDE IN THE FORM OF A GRAPH, OTHERS BY PUNCHED TAPE OR PRINTED FIGURES, AND STILL OTHERS BY PHOTOGRAPHIC MEANS.

TIDE STAFF: THE SIMPLEST NONREGISTERING GAGE IS A PLAIN STAFF OR BOARD GRADUATED IN UNITS OF LENGTH AND MOUNTED VERTICALLY ON A PILE OR OTHER SUITABLE SUPPORT. WATER LEVEL READINGS ARE MANUALLY RECORDED BY AN OBSERVER. IN ROUGH WATER A GLASS TUBE, PARTIALLY CLOSED AT THE LOWER END, CAN BE ATTACHED TO THE STAFF IN ORDER TO PROVIDE A WATER LEVEL FREE OF THE EFFECTS OF WAVE MOTION.

TAPE GAGE: THIS IS ANOTHER NONREGISTERING GAGE CONSISTING OF A TAPE ATTACHED TO A FLOAT IN A STILLING WELL. THE TAPE RUNS OVER A FIXED PULLEY ABOVE THE WELL AND A WEIGHT ON THE END OF THE TAPE KEEPS IT TAUT. THE WATER LEVEL IS READ BY AN OBSERVER FROM GRADUATIONS ON THE TAPE MOVING PAST A FIXED MARK OR FROM A MARK ON THE TAPE MOVING PAST A FIXED HEIGHT SCALE. THE STILLING WELL IS A LARGE PIPE OR BOX OPEN AT THE TOP WITH ONLY A SMALL HOLE AT THE BOTTOM FOR THE WATER TO ENTER SO THAT THE EFFECT OF WAVES OUTSIDE THE WELL IS MINIMIZED INSIDE.

ELECTRIC TAPE GAGE: A CONDUCTING GRADUATED TAPE IS LOWERED INTO A STILLING WELL. WHEN THE WEIGHT ON THE END OF THE TAPE TOUCHES THE WATER, AN ELECTRICAL CIRCUIT IS COMPLETED CAUSING NEEDLE MOVEMENT ON A VOLTMETER DIAL. THE OPERATOR READS THE GRADUATED TAPE AT A FIXED MARK WHEN HE OBSERVES THE NEEDLE DEFLECTION.

GAS PURGING PRESSURE TIDE GAGE (BUBBLER GAGE): THIS GAGE IS USED WHERE A SUPPORTING STRUCTURE IS UNAVAILABLE OR IMPRACTICAL. THE UNDERWATER PART OF THE GAGE CONSISTS OF SMALL BUBBLER ORIFICE CHAMBER ATTACHED TO A GAS-SUPPLY TUBE. THE SHORE END OF THE TUBING IS ATTACHED TO THE GAS SYSTEM WHICH INCLUDES A PRESSURE REGULATOR AND NITROGEN GAS STORAGE TANK, AND TO THE

TRANSDUCER (TEMPERATURE-COMPENSATED PRESSURE BELLOWS) OF A STRIP CHART RECORDER. WHEN THE GAS IS BUBBLED FREELY INTO THE WATER, THE PRESSURE IN THE TUBE IS APPROXIMATELY EQUAL TO THE PRESSURE HEAD OF THE WATER ABOVE THE OPENING. CHANGES IN PRESSURE CAUSED BY THE RISE AND FALL OF THE TIDE ARE RECORDED. THE BUBBLER ORIFICE CHAMBER IS SPECIALLY DESIGNED TO REDUCE THE EFFECTS OF WAVE-INDUCED PRESSURE FLUCTUATIONS.

PRECISION DEPTH RECORDER: SONIC DEPTH SOUNDERS CAN BE USED TO MEASURE THE TIDE FROM SHIPS AT ANCHOR OR, IF THE SONIC BEAM IS DIRECTED UPWARD, FROM SUBMERGED CAPSULES OR PLATFORMS.

STANDARD AUTOMATIC FLOAT GAGE: THE MODEL USED BY THE COAST AND GEODETIC SURVEY AUTOMATICALLY PRODUCES A CONTINUOUS WATER LEVEL TRACE ON A STRIP CHART. A FLOAT IN A STILLING WELL IS MECHANICALLY LINKED TO A WORM SCREW WHICH MOVES A PENCIL BACK AND FORTH ACROSS A MOVING STRIP OF PAPER. THE PAPER IS MOVED FOREWARD AT A UNIFORM RATE BY A CLOCK MOTOR. A TIMING CLOCK PRODUCES HOUR MARKS ON THE GRAPH. A COUNTER WEIGHT SYSTEM KEEPS THE FLOAT WIRE TAUT WHEN THE TIDE IS RISING.

PORTABLE AUTOMATIC FLOAT GAGE: THIS GAGE IS USED BY THE C + GOS FOR SHORT SERIES OF OBSERVATIONS. IT OPERATES ON THE SAME PRINCIPLE AS THE STANDARD AUTOMATIC GAGE BUT DOES NOT HAVE A SEPARATE TIMING CLOCK AND HAS A SMALLER DIAMETER STILLING WELL AND FLOAT WHICH REDUCES ITS ACCURACY. A NEGATOR-SPRING MAINTAINS FLOAT WIRE TENSION.

ANALOG-TO-DIGITAL RECORDER (ADR) GAGE: THIS IS THE TYPE OF TIDE GAGE NOW COMMONLY USED BY THE NATIONAL OCEAN SURVEY. IT IS A FLOAT-OPERATED INSTRUMENT USING A DRY-CELL BATTERY TO MECHANICALLY CONVERT THE MOTION OF A ROTATING FLOAT-WHEEL SHAFT INTO A CODED PUNCHED-PAPER-TAPE RECORD. THE WATER LEVEL TO THE NEAREST 0.01 FOOT IS PUNCHED AT SELECTED INTERVALS REGULATED BY A SMALL TIMING CLOCK.

4. KEY PUBLICATIONS:

SHALOWITZ, AARON L., 1962. SHORE AND SEA BOUNDARIES: WITH SPECIAL REFERENCE TO THE INTERPRETATION AND USE OF COAST AND GEODETIC SURVEY DATA, VOLS I AND II. U.S. DEPARTMENT OF COMMERCE, COAST AND GEODETIC SURVEY PUBLICATION 10-1. U.S. GOVERNMENT PRINTING OFFICE.

SCHUREMAN, PAUL. MANUAL OF HARMONIC ANALYSIS AND PREDICTION OF TIDES. U.S. DEPARTMENT OF COMMERCE, COAST AND GEODETIC SURVEY SPECIAL PUBLICATION NO. 98. REVISED (1940) EDITION. U.S. GOVERNMENT PRINTING OFFICE.

5. PERSONAL REFERENCES:

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WIND INFORMATION SECTION

1. OTHER SOURCES TO CHECK:
   NATIONAL WEATHER DATA CENTER
   ASHVILLE, N.C.

2. METHODS:

THE PRINCIPLES OF WIND DIRECTION AND WIND SPEED MEASUREMENT AND RECORDING ARE DISCUSSED BY MIDDLETON AND SPILHAUS (1953). SEVERAL TYPES OF ANEMOMETERS ARE LISTED BY MIDDLETON AND SPILHAUS, THOUGH THE PRINCIPLE ANEMOMETERS USED IN MICROMETEOROLOGY ARE THE ROTATING CUP AND FORMS OF HOT-WIRE ANEMOMETERS.

WIND DIRECTION INDICATORS: THE WIND VANES AND RECORDING SYSTEMS DISCUSSED BY MIDDLETON AND SPILHAUS ARE AVAILABLE COMMERCIALLY. ALSO AVAILABLE ARE WIND-FORCED BIVANES WHICH INDICATE BOTH AZIMUTH AND ELEVATION ANGLES OF THE WIND AS USED IN SOME WIND TURBULENCE STUDIES. PRESSURE SENSOR-SERVO VANES HAVE ALSO BEEN USED. LOW-TORQUE, WIRE-WOUND POTENTIOMETERS MOST FREQUENTLY ARE DRIVEN BY WIND VANES TO SENSE DIRECTION. IN ORDER TO AVOID MECHANICAL DRAG OF THESE ELEMENTS, ROTATING LIGHT MASKS AND PHOTO SENSORS CAN BE USED; ALSO LIGHT- ACTUATED POTENTIOMETERS APPEAR PROMISING.

CUP ANEMOMETERS: MANY CUP ANEMOMETERS ARE AVAILABLE COMMERCIALLY THAT ARE USEFUL FOR ROUTINE WIND TRAVEL MEASUREMENTS. THEY DIFFER IN RUGGEDNESS AND RELIABILITY IN ADVERSE WEATHER AND IN MAINTENANCE REQUIREMENTS; FEW, IF ANY, WILL OPERATE UNDER FREEZING RAIN.

HOT-WIRE ANEMOMETERS: HOT-WIRE ANEMOMETERS ARE EXTENSIVELY USED IN WIND TUNNEL WORK. THEY ARE BEING USED INCREASINGLY IN MICROMETEOROLOGICAL AND ENVIRONMENTAL STUDIES FOR MEASURING LOW VELOCITY WINDS; THEY ARE ALSO USEFUL FOR SMALL SPACES AND WHERE FAST RESPONSE IS NECESSARY. THESE INSTRUMENTS DEPEND ON THE HEAT LOSS FROM AN ELECTRICALLY HEATED WIRE.

HOT-BEAD ANEMOMETERS: THE PRINCIPLES OF HEATED BEAD ANEMOMETERS ARE SIMILAR TO THOSE OF HOT-WIRE ANEMOMETERS EXCEPT THAT THE TRANSFER IS MUCH LESS DEPENDENT ON WIND DIRECTION PROVIDED HEAT DISSIPATION IN SUPPORTING LEADS IS SMALL. THE RESPONSE TIME OF THE HOT-BEAD ANEMOMETER IS LONG COMPARED TO SMALL HOT-WIRES.

HEATED-WAKE ANEMOMETER: THIS IS A STABLE, DIRECTIONAL, LINEARIZED ANEMOMETER DESIGNED SPECIALLY FOR EDDY FLUCTUATION MEASUREMENTS. THE TEMPERATURE RISE OF AIR MOVING PAST A FINE, LONG, HEATED WIRE IS DETECTED BY A SECOND WIRE SPACED BEHIND BUT WITH AXIS NORMAL TO THE HEATED WIRE. THE ANEMOMETER RESPONSE IS OF THE ORDER OF 0.1 TO 0.2 SEC AND CAN BE DESIGNED FOR A LARGE RANGE OF SPEEDS. THIS DESIGN HAS MUCH TO RECOMMEND IT OVER CONVENTIONAL, CROSSED HOT-WIRE ANEMOMETERS FOR MICROMETEOROLOGICAL WORK BECAUSE OF ITS STABILITY, INSENSITIVITY TO AIR TEMPERATURE, AND LINEARITY.

SONIC ANEMOMETERS: THE SONIC ANEMOMETER HAS BEEN DEVELOPED PRIMARILY FOR EDDY FLUCTUATION MEASUREMENTS WHERE A FAST RESPONSE INSTRUMENT IS NEEDED; IT IS NOT SUBJECT TO THE REACTIVE LAGS PRESENT IN MECHANICAL ANEMOMETERS. THE VELOCITY OF SOUND OVER FIXED DISTANCE DEPENDS ON BOTH THE TEMPERATURE AND THE WIND SPEED SO THAT THE SONIC ANEMOMETER CAN BE USED TO MEASURE BOTH WIND VELOCITY AND THE AIR TEMPERATURE. THE SOUND VELOCITY OVER A FIXED PATH IN BOTH DIRECTIONS IS REQUIRED TO SEPARATE THE TEMPERATURE AND WIND SPEED EFFECTS.

VORTEX FREQUENCY ANEMOMETER: VORTEX FREQUENCY FLOW METERS HAVE BEEN ADAPTED TO FUNCTION AS ANEMOMETERS. THEY OPERATE ON THE PRINCIPLE THAT THE FREQUENCY AT WHICH VORTICES IN A MOVING FLUID PASS A SENSOR MOUNTED DOWNSTREAM FROM A FIXED WIRE IS PROPORTIONAL TO THE SPEED OF THE FLUID. THIS TYPE OF ANEMOMETER IS AVAILABLE COMMERCIALLY, AND IS USED ON THE NOAA OCEANOGRAPHIC DATA BUOYS.

3. PUBLICATION REFERENCES:

MIDDLETON, W.E.K., AND A.F. SPILHAUS, 1953. METEOROLOGICAL INSTRUMENTS. UNIV. TORONTO PRESS, CANADA

TANNER, C.B., 1963. BASIC INSTRUMENTATION AND MEASUREMENTS FOR PLANT ENVIRONMENT AND MICROMETEOROLOGY. SOILS BULLETIN 6, DEPT. SOIL SCIENCE, COLLEGE OF AGRICULTURE, UNIV. OF WISCONSIN, MADISON, WISCONSIN

4. PERSONAL REFERENCES:

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BATHYMETRY INFORMATION SECTION

1. OTHER SOURCES TO CHECK.

OASIS/ENDEX

BIBLIOGRAPHY-DATA LOCATION INDEX FOR ALL TYPES OF DATA AVAILABLE ON ENVIRONMENTAL PROBLEMS. NO MODELS INCLUDED. OASIS INCLUDES THE SEARCH OF MANY OTHER INDEXES, SUCH AS DDC AND NTIS:

CONTACT:
OASIS/ENDEX
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
WISCONSIN AVENUE
WASHINGTON, DC

2. METHODS:

LEAD LINE: A LINE WEIGHTED AT ONE END IS LOWERED FROM THE BOAT OR PIER TO THE BOTTOM AND THE DISTANCE MEASURED AS THE LINE GOES SLACK. USABLE IN ALL BUT THE DEEPEST WATER. THIS IS THE LEAST SATISFACTORY METHOD OF OBTAINING BATHYMETRIC DATA. ALL DATA PRIOR TO WORLD WAR II, HOWEVER, ARE OF THIS TYPE.

SEA SLED: A SLED BEARING A VERTICAL POLE IS DRAGGED ALONG THE BOTTOM, FROM OFFSHORE TO THE BEACH. INSTRUMENT READINGS ARE MADE ON THE POLE. THIS IS PRIMARILY A SHALLOW WATER METHOD. THIS SYSTEM IS THE MOST ACCURATE FOR SURF ZONE SURVEYING. IT IS LIMITED BY THE EQUIPMENT TO ABOUT 10M. THE VERTICAL ACCURACY IS ABOUT 0.1M.

FATHOMETER (ECHO SOUNDER): THERE ARE MANY VERSIONS OF THIS ACOUSTICAL METHOD, IN WHICH A SIGNAL IS BEAMED FROM A BOAT MOUNTED TRANSPONDER, REFLECTS OFF THE BOTTOM, AND IS PICKED UP BY A HYDROPHONE, USUALLY MOUNTED IN THE HULL OF THE BOAT OR SHIP. OUTPUT IS USUALLY AN UNCALIBRATED TRACE ON CHART PAPER. HIGHEST QUALITY DATA IN ALL DEPTHS GREAT ENOUGH TO PERMIT SAFE NAVIGATION IS GENERATED BY THIS METHOD.

SEISMIC PROFILERS: BOTTOM TRACES ARE A BYPRODUCT OF MANY SEISMIC DEVICES, SUCH AS SPARKERS. HOWEVER, BECAUSE THESE INSTRUMENTS ARE DESIGNED TO PRODUCE SUB-BOTTOM CONTOURS, THE ACCURACY OF THE BOTTOM ECHO IS FREQUENTLY DOUBTFUL.

MUTIPLE SONAR ARRAYS: IN RECENT YEARS, BATHYMETRIC MEASURING SYSTEMS CONSISTING OF BANKS OF TRANSPONDERS AND HYDROPHONES HAVE BEEN DESIGNED. THESE CAN BE COUPLED WITH A MINI-COMPUTER TO PROVIDE CONTINUOUS QUALITY CONTROL ON PORTIONS OF THE BOTTOM WHICH ARE OVERLAPPED BY TWO ADJACENT STRIPS. DATA ARE REPORTED AS AN AREA, NOT AS A LINE. OUTPUT IS AS DIGITIZED DEPTH POINTS OR AS A CONTOUR MAP. THIS METHOD GIVES THE HIGHEST POSSIBLE QUALITY OF BATHYMETRIC DATA. IT IS PRIMARILY INTENDED AS A DEEP WATER DEVICE, BUT THERE ARE SHALLOW WATER SYSTEMS.

3. PERSONAL REFERENCES:

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COASTAL ENGINEERING RESEARCH CENTER
FT. BELVOIR, VA, 22060.

WILLIAM HART
U.S. NAVY OCEANOGRAPHIC OFFICE,
NAVY DEPARTMENT,
WASHINGTON, DC

BEACH CHARACTERISTICS INFORMATION SECTION

1. OTHER SOURCES TO CHECK:

OASIS/ENDEX
OASIS IS A BIBLIOGRAPHY INDEX WHICH INCLUDES THE SEARCH OF MANY OTHER INDEXES, SUCH AS DDC AND NTIS. ENDEX IS A DATA LOCATION INDEX FOR ALL TYPES OF DATA AVAILABLE ON ENVIRONMENTAL PROBLEMS. NO MODELS ARE INCLUDED.

CONTACT:
OASIS/ENDEX
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
WISCONSIN AVENUE
WASHINGTON, D.C. 20235

U.S. CORPS OF ENGINEERS DISTRICT OFFICES AND COASTAL ENGINEERING RESEARCH CENTER, FORT BELVOIR, VIRGINIA. THE CORPS DISTRICTS WITH COASTAL JURISDICTION CONDUCT NUMEROUS BEACH SURVEYS. THE DISTRICT OFFICES ARE LOCATED IN BOSTON, NEW YORK, PHILADELPHIA, BALTIMORE, NORFOLK, WILMINGTON, CHARLESTON, SAVANNAH, JACKSONVILLE, MOBILE, NEW ORLEANS, GALVESTON, LOS ANGELES, SAN FRANCISCO, PORTLAND, SEATTLE, AND ANCHORAGE.

COASTAL PLAINS MARINE CENTER
THE CENTER ACTS AS A CLEARINGHOUSE AND REFERRAL CENTER FOR SCIENTIFIC AND TECHNICAL INFORMATION ON THE MARINE ENVIRONMENT OF VIRGINIA, NORTH CAROLINA, SOUTH CAROLINA, GEORGIA, AND PART OF FLORIDA.

CONTACT:
COASTAL PLAINS CENTER FOR MARINE DEVELOPMENT SERVICES
1518 HARBOUR DRIVE
WILMINGTON, N.C. 28401

2A. METHODS, BEACH TOPOGRAPHY:

BEACH TOPOGRAPHY IS COMMONLY MEASURED AS ELEVATION PROFILES ALONG LINES PERPENDICULAR TO THE SHORELINE. BEACH WIDTH, SLOPE, AND CUSP SPACING ARE OTHER TOPOGRAPHIC VARIABLES FREQUENTLY MEASURED.

ROD AND TRANSIT: A STADIA ROD AND TRANSIT OR HAND LEVEL ARE USED TO MEASURE ELEVATIONS AT INTERVALS ALONG PROFILE LINES. THE ELEVATION AT EACH STATION IS MEASURED RELATIVE TO A FIXED DATUM OR TO THE TOP END OF THE PROFILE.

FIXED STAKES OR PIERS: PIPES OR RODS DRIVEN INTO THE BEACH ARE USED AS FIXED REFERENCES FOR MEASURING SAND ELEVATION CHANGES. THIS METHOD IS OFTEN USED WHEN A PROFILE LINE IS RESURVEYED A NUMBER OF TIMES. PIERS EXTENDING ACROSS THE BEACH ALSO PROVIDE FIXED ELEVATION REFERENCES FOR BEACH PROFILES. EACH PIPE OR STATION ON A PIER SHOULD BE TIED TO A COMMON DATUM.

STAKE-AND-HORIZON: TWO GRADUATED STAKES OR RODS ABOUT 1.5 METERS LONG ARE USED IN CONJUNCTION WITH THE HORIZON TO MEASURE ELEVATIONS ALONG A PROFILE. THE SURVEYORS PLACE THEIR STAKES ON THE BEACH WITH A KNOWN DISTANCE BETWEEN THEM, AND THE SHOREWARD OBSERVER SIGHTS ALONG AN IMAGINARY LEVEL LINE FROM THE TOP OF THE LOWER STAKE TO THE HORIZON. THE POINT OF INTERSECTION OF THE IMAGINARY LINE WITH THE HIGHER STAKE IS RECORDED AS THE DIFFERENCE IN ELEVATION BETWEEN THE STAKES. THIS PROCESS IS REPEATED DOWN THE PROFILE. THE HEIGHT OF THE OBSERVER ABOVE THE HORIZON INTRODUCES A SMALL ERROR.

INCLINOMETER: BEACH SLOPE IS OFTEN MEASURED BY AN INCLINOMETER. THE INCLINOMETER MAY BE PLACED ON A STRAIGHT BOARD TO MEASURE THE AVERAGE SLOPE OVER THE LENGTH OF THE BOARD. SLOPE CAN ALSO BE CALCULATED FROM PROFILE DATA.

AERIAL PHOTOGRAPHY: BEACH WIDTH, CUSP SPACING, INSHORE BAR AND TROUGH TOPOGRAPHY, ETC., CAN BE MEASURED ON AERIAL PHOTOGRAPHS.

LEAD LINE, FATHOMETER, OR SEA SLED: THESE CAN ALL BE USED TO MEASURE INSHORE BAR AND TROUGH TOPOGRAPHY, BUT THE FIRST TWO REQUIRE A BOAT AND ARE THEREFORE LIMITED TO DEEPER WATER UNLESS CONDITIONS ARE CALM. SEE THE BATHYMETRY INFORMATION SECTION FOR MORE DETAIL ON THESE METHODS.

2B. METHODS, SEDIMENT ANALYSIS:

RAPID SEDIMENT ANALYZER (RSA): IN THIS METHOD A SMALL SAMPLE IS INTRODUCED AT THE TOP OF A COLUMN OF WATER. THE SEDIMENT IS ALLOWED TO SETTLE FOR A DISTANCE, USUALLY A METER, AND A CURVE IS PRODUCED SHOWING A PLOT OF TIME VERSUS THE CUMULATIVE WEIGHT OF THE SEDIMENT THAT HAS SETTLED OUT OF THE WATER COLUMN. THE SENSING DEVICE IS EITHER A DIFFERENTIAL PRESSURE GAUGE OR A MICRO-BALANCE. MEAN GRAIN SIZE, SORTING, AND OTHER SAMPLE PARAMETERS CAN BE TAKEN FROM THE WEIGHT DISTRIBUTION CURVE USING MOMENT MEASURES.

SIEVING: IN THIS CLASSICAL METHOD, THE SAMPLE IS INTRODUCED INTO A SET OF METAL SIEVES. THE MATERIAL IS SHAKEN IN THE SIEVES BY A MECHANICAL DEVICE UNTIL THE SEDIMENT IS JUDGED TO HAVE BEEN DISTRIBUTED INTO THE APPROPRIATE SIZE SIEVE. THE WEIGHT OF MATERIAL IN EACH SIEVE IS MEASURED AND MEAN, SORTING AND OTHER PARAMETERS ARE COMPUTED FROM THE WEIGHT INFORMATION.

MICROSCOPIC ANALYSIS: A SMALL SAMPLE IS PLACED ON A GRIDDED PETRI DISH, AND THE LENGTH OF THE INTERMEDIATE AXIS IS MEASURED FOR A FIXED NUMBER OF GRAINS, WHICH VARIES FROM SET TO SET OF SAMPLES. THE MEAN AND OTHER PARAMETERS CAN BE COMPUTED DIRECTLY FROM THE MEASURED GRAIN SIZES. EITHER STAGE OR PROJECTING MICROSCOPES MAY BE USED.

VISUAL ESTIMATION: THE TEXTURE OF THE SEDIMENT IN SITU IS COMPARED TO A PRE-GRADED SET OF SAMPLES TAKEN FROM THE SAME SITE. ONLY MEAN GRAIN SIZE CAN BE DETERMINED.

3. REFERENCES:

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BASCOM, W., 1964. WAVES AND BEACHES; THE DYNAMICS OF THE OCEAN SURFACE. ANCHOR BOOKS, GARDEN CITY, N.Y.

KRUMBEIN, W.C., AND F.J. PETTIJOHN, 1938. MANUAL OF SEDIMENTARY PETROGRAPHY. D. APPLETON-CENTURY CO. INC., NEW YORK.

U.S. ARMY, CORPS OF ENGINEERS, CERC, SHORE PROTECTION MANUAL, 2ND ED., VOLS. I, II, AND III. U.S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C., 1975.

4. ATLANTIC COAST PERSONAL REFERENCES:

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APPENDIX F

Program REFORMAT
Program Listing
SHARP Input Sample
REFORMAT Output Sample

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      PROGRAM REFORMAT (INPUT,OUTPUT,TAPE4=INPUT,TAPE6=OUTPUT)
C   THIS PROGRAM READS THE SHARP INPUT DECK AND OUTPUTS ONE DATA ELEMENT PER
C   LINE WITH THE RECORD ID, ELEMENT NUMBER, ELEMENT SIZE, AND ENTRY SEQUENCE
C   NUMBER.
C   VARIABLE DEFINITIONS:
C     AC = ACTIVITY CODE (A, C, OR D) AT START OF A NEW RECORD.
C     A(I) = ARRAY FOR ALL CHARACTERS IN AN ENTIRE RECORD.
C     B(J) = ARRAY FOR ALL CHARACTERS IN A SINGLE DATA ENTRY.
C     END = FLAG INDICATING END OF ONE RECORD AND START OF THE NEXT.
C     F = FLAG FOR PRECEDING RIGHT PARENTHESIS.
C     II = SUBSCRIPT NUMBER FOR VALUE IN FIRST COLUMN OF CARD.
C     LL = SUBSCRIPT NUMBER FOR LAST COLUMN (72) OF CARD.
C     P = FLAG FOR PRESENCE OF PRECEDING LEFT PARENTHESIS.
C     R(M) = ARAAY FOR RECORD ID NUMBER.
C     T = FLAG FOR TYPE 1 (4 CHARACTERS) OR TYPE 2 (8 CHARS) RECORD ID NUMBER.
C     X(1) AND X(2) = DIGITS OF ELEMENT NUMBER.
NAME EXCEEDS 7 CHARACTERS -- TRUNCATED TO ≠REFORMA
      IMPLICIT INTEGER (E,F,P,T)
      DIMENSION A(4000),B(2000),R(10),X(2)
      LOGICAL Q1,Q2,Q3,Q4,Q5
      DATA END/1/,P/2/,II/1/,F/2/
  100 FORMAT(72A1)
  101 FORMAT(1X,A1,2X,4A1,7X,I4,3X,2A1,I4,2X,60A1/(30X,60A1))
  102 FORMAT(1X,A1,2X,8A1,3X,I4,3X,2A1,I4,2X,60A1/(30X,60A1))
  103 FORMAT(1X,≠ERROR: IMPROPER USE OF $≠)
  104 FORMAT(1X,4H$END)
  105 FORMAT(1H1,≠A/C≠,X,≠RCDID≠,5X,≠SIZE  ELM  SEQ  DATA≠//)
  106 FORMAT(1X,≠ERROR: NO BLANK BEFORE ELEMENT NUMBER OR $END≠)
      WRITE(6,105)
      GO TO 3
C   AFTER I IS INCREMENTED, IF A(I) IS IN CARD COLUMN 71, READ NEXT CARD.
    1 IF(I-II.EQ.70) 2,10
    2 II=I+2
    3 LL=II+71
      READ(4,100) (A(L),L=II,LL)
      IF(EOF(4))60,4
C   SPECIAL ROUTINE FOR WHEN CARD JUST READ IS START OF A NEW RECORD.
    4 IF(END.NE.1) GO TO 10
      AC=A(1)
      X(1)=≠ ≠
      X(2)=≠0≠
      I=3
      J=0
      K=1
      END=2
C   SET FLAG FOR LEFT PAREN.
   10 IF(A(I).EQ.1H() P=1
C   HANDLING OF RIGHT PAREN DEPENDS UPON EXISTENCE OR NON-EXISTENCE OF A
C   PRECEDING LEFT PAREN.
      IF(A(I).EQ.≠)≠) 12,20
   12 GO TO (13,14) P
   13 P=2
      GO TO 20
   14 IF(A(I-2).EQ.1H )141,145
  141 N=J-2
      IF(A(I-3).EQ.1H ) N=J-3
      GO TO (15,15,17) END
  145 N=J-3
      IF(A(I-4).EQ.1H ) N=J-4
      GO TO (15,15,17) END
C   STORE RCDID IN ARRAY R, STORE SIZE OF R IN MM.
   15 DO 16 M=1,N
   16 R(M)=A(M+2)
      MM=N
      T=1
      END=3
      IF(MM.GT.5) T=2
   17 GO TO (170,171) T
C   WRITE PREVIOUS DATA ELEMENT AFTER RIGHT PAREN INDICATES START OF NEXT ELEMENT
  170 WRITE(6,101)AC,(R(M),M=1,MM),N,X(1),X(2),K,(B(L),L=1,N)
      GO TO 18
  171 WRITE(6,102)AC,(R(M),M=1,MM),N,X(1),X(2),K,(B(L),L=1,N)
   18 X(1)=B(J-1)
      X(2)=B(J)
      IF(A(I-1).EQ.≠$≠) WRITE(6,103)
      Q1=(A(I-2).NE.1H ).AND.(A(I-3).NE.1H )
```

```
      IF(Q1) WRITE(6,106)
      J=0
      K=1
      I=I+1
C  FLAG F IS SET TO INDICATE PRECEDING RIGHT PAREN.
      F=1
      GO TO 1
C  CHECK FOR SEMI-COLON.
   20 IF(A(I).EQ.#;#) 21,30
C  IF SEMI-COLON OCCURS IN A NON-REPEATING TEXTUAL ELEMENT, TREAT IT AS DATA.
   21 Q1=(X(1).EQ.1H2).AND.((X(2).EQ.1H0).OR.(X(2).EQ.1H1))
      Q2=(X(1).EQ.1H1)
      Q3=(X(1).EQ.1H ).AND.(X(2).EQ.1H4)
      Q4=(X(1).EQ.1H7).AND.(X(2).EQ.1H9)
      Q5=(X(2).EQ.1H2).OR.(X(2).EQ.1H3).OR.(X(2).EQ.1H4).OR.
     1(X(2).EQ.1H5).OR.(X(2).EQ.1H6).OR.(X(2).EQ.1H8).OR.(X(2).EQ.1H9)
      IF(Q1.OR.Q3.OR.Q4) GO TO 50
      IF(Q2.AND.Q5) GO TO 50
C  CHECK FOR PRESENCE OR ABSENCE OF DATA BEFORE SEMI-COLON.
      IF(J.EQ.0)28,27
   27 GO TO (271,272) T
  271 WRITE(6,101)AC,(R(M),M=1,MM),J,X(1),X(2),K,(B(L),L=1,J)
      J=0
      GO TO 28
  272 WRITE(6,102)AC,(R(M),M=1,MM),J,X(1),X(2),K,(B(L),L=1,J)
      J=0
C  INCREMENT K TO INDICATE SEQUENCE NO. OF DATA ENTRY IN REPEATING ELEMENT.
   28 K=K+1
      IF(A(I-1).EQ.#$#) WRITE(6,103)
      I=I+1
C  SET FLAG F TO INDICATE PRECEDING SEMI-COLON.
      F=1
      GO TO 1
C  CHECK FOR $, $$, OR SEND.
   30 IF(A(I).EQ.#$#) 31,40
   31 IF(II.EQ.I+1) WRITE(6,103)
      IF(A(I+1).EQ.#$#) 32,33
   32 IF(II.EQ.I+2)321,325
  321 I=II
      F=2
      GO TO 10
  325 I=I+2
      II=I
      F=2
      GO TO 3
   33 IF(A(I+1).EQ.#E#) 34,50
C  END OF RECORD. WRITE LAST DATA AND RESET II.
   34 END=1
      F=2
      II=1
      N=J-1
      IF(A(I-2).EQ.1H ) N=J-2
      GO TO (361,362) T
  361 WRITE(6,101)AC,(R(M),M=1,MM),N,X(1),X(2),K,(B(L),L=1,N)
      GO TO 37
  362 WRITE(6,102)AC,(R(M),M=1,MM),N,X(1),X(2),K,(B(L),L=1,N)
   37 IF(A(I-1).NE.1H ) WRITE(6,106)
      WRITE(6,104)
      GO TO 3
C  CHECK FOR SERIES OF BLANKS, USING F VALUE TO DROP ALL BLANKS AFTER
C  ELEMENT NUMBER RIGHT PAREN AND SEMI-COLONS IN REPEATING ELEMENTS.
   40 IF(A(I).EQ.1H ) 41,50
   41 GO TO (44,42) F
   42 IF(A(I+1).EQ.1H ) 43,50
   43 IF(A(I+2).EQ.1H ) 44,50
   44 I=I+1
      GO TO 1
C  IF A(I) IS NOT A DATA ENTRY SEPARATOR OR PART OF A $$, SEND, OR A
C  STRING OF BLANKS, STORE THE VALUE IN B(J).
   50 J=J+1
      B(J)=A(I)
      F=2
      I=I+1
      GO TO 1
   60 CONTINUE
      END
```

Sample of SHARP Input read by Program REFORMAT

```
A 0129-001 7)01;02;03 29)411815N 30)0715230W 31)7407111582 32)US 33)NAT
34)1;2 36)NAPATREE BEACH, RHODE ISLAND 37)BAYSIDE BEACH 38)3 39)1 40)700
5 41)7006 42)008 43)0 44)1 47)6/DAY 48)0101;0102;0106;0118;0204;0301 49)
01024;01017;01010;1;02003;03005 50)3
21)WAVE LENGTH, L, WAS CALCULATED EMPIRICALLY USING THE EQUATION, L=5.12
(T SQUARED), WHERE T IS THE WAVE PERIOD IN SECONDS. $END
```

Sample of output from Program REFORMAT (generated from the above sample of input)

A/C	RCDID	SIZE	ELM	SEQ	DATA
A	0129-001	8	0	1	0129-001
A	0129-001	2	7	1	01
A	0129-001	2	7	2	02
A	0129-001	2	7	3	03
A	0129-001	7	29	1	411815N
A	0129-001	8	30	1	0715230W
A	0129-001	10	31	1	7407111582
A	0129-001	2	32	1	US
A	0129-001	3	33	1	NAT
A	0129-001	1	34	1	1
A	0129-001	1	34	2	2
A	0129-001	28	36	1	NAPATREE BEACH, RHODE ISLAND
A	0129-001	13	37	1	BAYSIDE BEACH
A	0129-001	1	38	1	3
A	0129-001	1	39	1	1
A	0129-001	4	40	1	7005
A	0129-001	4	41	1	7006
A	0129-001	3	42	1	008
A	0129-001	1	43	1	0
A	0129-001	1	44	1	1
A	0129-001	5	47	1	6/DAY
A	0129-001	4	48	1	0101
A	0129-001	4	48	2	0102
A	0129-001	4	48	3	0106
A	0129-001	4	48	4	0118
A	0129-001	4	48	5	0204
A	0129-001	4	48	6	0301
A	0129-001	5	49	1	01024
A	0129-001	5	49	2	01017
A	0129-001	5	49	3	01010
A	0129-001	1	49	4	1
A	0129-001	5	49	5	02003
A	0129-001	5	49	6	03005
A	0129-001	1	50	1	3
A	0129-001	120	21	1	WAVE LENGTH, L, WAS CALCULATED EMPIRICALLY USING THE EQUATIO N, L=5.12(T SQUARED), WHERE T IS THE WAVE PERIOD IN SECONDS.

$END

APPENDIX G

File Inventory
Data File - Type 1 Records
Model File - Type 3 Records

DATA FILE - TYPE 1 RECORDS

RECORD	STUDY
0001	CERC Wave Gauge Program: Wave gauges at 35 sites.
0002	CERC Beach Evaluation Program: East coast beach surveys, grain size, and bathymetry.
0003	NOAA Environmental Data Buoy Program: Waves and meteorologic and oceanographic variables.
0004	Scripps Wave Report No. 68: Seasonal summaries of hindcast wave data for 1936-38 at 5 open sea locations off California.
0005	Ocean Data Gathering Program-Gulf of Mexico: Waves, wind, and pressure measured on 6 offshore oil rigs during 1968-1971.
0006	Cooperative Surf Observations Program (COSOP): Visual surf observations at 36 Coast Guard stations, 1954-.
0007	CERC Littoral Environments Observations: Waves, wind, and beach characteristics at 93 sites.
0008	Waves at Camp Pendleton, CA: Wave gauge data for 1953-1961, collected by W.H. Powers, IG & PF LaJolla, and Draper, NIO Great Britain.
0009	Waves off Benghazi Harbor, Libya: Gauge data collected by L. Draper, NIO Great Britain.
0010	Seismic Wavemeters in Oregon and Washington: Data from 7 sites is collected by the Coast Guard and Oregon State University.
0011	Oceanographic Observations, East Coast of U.S.: Daily temperature and salinity at 25 light stations collected by WHOI and the Coast Guard.
0012	Cape Cod Area Beach Studies: Beach surveys made at 7 sites by J.M. Zeigler while at WHOI.
0013	NOS Primary Tide Stations: Tide gauge data from control stations.
0014	NOS Water Temperature and Density Stations: Data collected mainly at primary tide stations.
0015	KNMI-NOGEPA Wind and Wave Climate Study: Gauge data from two sites on the Netherlands continental shelf collected

by the Royal Netherlands Meteorological Institute and the Netherlands Oil and Gas Exploration and Production Association.

0016 Wave observations on Cobb Seamount: Seven months of gauge data collected by the University of Washington.

0017 Eastern Caribbean Wave Climate: Gauge and visual wave data collected at 4 sites by Compton Deane, University of the West Indies.

0018 USCG Airborne Radiation Thermometer Program: Sea surface temperatures measured monthly off the east coast of the U.S.

0019 Wave Climate at Torry Pines Beach, CA: Data from a pressure gauge collected by D.L. Inman and CERC.

0020 Digital Bathymetric Data for U.S. Coastal Regions: NOS digitized bathymetric data file and catalogue.

0021 Cape Hatteras Beach Nourishment Study: Beach surveys and nearshore bathymetry surveys done by John Fisher, UVA.

0022 UVA Wave Hindcast Studies: Wave hindcast data for extra-tropical and tropical (at Cape Hatteras only) storms at 6 sites along the East coast of the U.S., held by Bruce Hayden.

0023 Integrated Model of Storm Waves, Mid-Atlantic Coast: Statistical summary of storm surge, storm track, and breaker height data for 1899-1969, done by D.T. Resio.

0024 Radioisotopic Sand Tracer Studies, Point Conception, CA: Sediment transport and bathymetry measured by CERC.

0025 Summary of Synoptic Meteorological Observations, North American Atlantic and Gulf Coasts: USN Weather Service Command publication.

0026 Inshore Bathymetry Profiles: Collected from various sources by R. Dolan for ONR project.

0027 Langley-McDonald Inshore Bathymetry Profiles, Va. Beach: Held by Corps of Engineers Norfolk Office.

0028 Beach Erosion Board Bathymetry Profiles: Profiles for 15 sites on the East and Gulf coasts are held by CERC.

0029 Bathymetric Profiles (Inshore): Profiles from 4 sites, held by CERC.

0030 Texas Coast Inlet Studies: Inshore bathymetric profiles held by the Corps of Engineers Galveston Office.

0031 Florida Coast Inshore Bathymetry Profiles: Held by the Corps of Engineers Jacksonville Office.

0032 Maryland Coast Inshore Bathymetry Profiles: Held by the Corps of Engineers Baltimore Office.

0033 New Jersey Coast Inshore Bathymetry Profiles: Held by the Corps of Engineers Philadelphia Office.

0034 Tropical Storm Climatology, U.S. East and Gulf Coasts: Probability distribution of various storm parameters for each 50KM segment of coastline, NOAA report.

0035 Oregon Coast Beach Profiles and Onshore-Offshore Transport: Profiles and sediment transport calculations for 2 sites, held by Paul Komar.

0036 Canada Marine Environmental Data Service Wave Climate Study: Wave gauge data from 116 sites.

0037 Beach Profiles, Cape Cod, MA: Surveys of 16 beaches done by Victor Goldsmith.

0038 Delaware Coast Storm Protection Study: Profiles, sediment data, and nearshore bathymetry held by Corps of Engineers Philadelphia Office.

0039 Delaware Coast Study: Beach profiles, sediment data, and nearshore bathymetry held by Corps of Engineers Philadelphia Office.

0040 Delaware Bay Beach Study: Beach profiles, sediment data, and nearshore bathymetry held by Corps of Engineers Philadelphia Office.

0042 Radar Weather Observations: Radar scope photography of weather echoes at 32 sites within range of the U.S. coast, held at NCC.

0043 CERC Beach Evaluation Program Wave Data Summmary: Wave, currents, and wind data for 64 sites.

0044 Beach Maintenance at Virginia Beach: Beach surveys, bathymetry, wave, current, wind, and sediment data collected on an on-going basis by Langley-McDonald.

0045 Beach Survey, Hunting Island Beach, SC: Beach survey, sediment, and bathymetry data held by the Corps of Engineers Charleston Office.

0046 Beach Surveys, Atlantic Coast of Maryland and Assateague, Island: Survey, sediment, and bathymetry data held by the Corps of Engineers Baltimore Office.

0047 NCC Hourly, Synoptic, and Autographic Original Records: Meteorological data collected at 455 weather stations within 10 miles of the U.S. East and Gulf coasts.

0048 Measurements of Beach Process Variables, Outer Banks, NC: Study done by Robert Dolan.

0049 Nags Head Offshore Sand and Bathymetry: Hydrographic survey and sand samples collected by the USC & GS, grain size data held by Robert Dolan.

0050 Beach Erosion Control Studies, Florida: Current, bathymetry, sediment, and beach morphology data held by the Corps of Engineers Jacksonville Office.

0051 New England Shore Protection Projects: Data on bathymetry, sediments, and beach morphology at 37 sites held by the the Corps of Engineers New England Division.

0052 NCC Hourly, Synoptic, and Autographic Records-West Coast: Meteorological data collected at weather stations within 10 miles of the U.S. Pacific coast.

0053 Florida Coastal Construction Setback Line: Beach profiles at 1000 Ft intervals along the coast are surveyed every 5 years by the Florida Department of Natural Resources.

0054 A Time Series from the Beach Environment, Va. Beach: W. Harrison's 26 day study of waves, currents, bathymetry, beach morphology, etc.

0055 A Time Series from the Beach Environment II, Va. Beach: A study similar to 0054 done 3 years later by Wyman Harrison.

0056 Beaches Near San Francisco, CA, 1956-57: Survey and sediment data from 18 sites collected by Trask of the Waves Research Lab, Berkeley, for the Beach Erosion Board.

0057 Coastal Dynamics along Mustang Island, TX: A beach process-response study conducted by Davis and Fox.

0058 Coastal Dynamics on Cedar Island, VA: Same as 0057.

0059 Beach Changes at Virginia Beach: Beach profiles and nearshore bathymetry collected by Wyman Harrison.

0060 Short Term Variations in Beach Morphology, Plum Island, MA: Study conducted by R.W. Abele, Jr. of University of Maryland for CERC.

0061 Suspended Sediment in the Littoral Zone, Ventnor, NJ, and Nags Head, NC: Beach morphology and sediment data collected by Fairchild for CERC.

0062 Currents and Temperatures in the Southeast Florida Coastal Zone: Study by NOAA Environmental Research Labs, Miami.

0063 Dynamic Properties of Immersed Sand at Virginia Beach: A Wyman Harrison study for CERC.

0064 Interactions of the Beach-Ocean-Atmosphere System at Va. Beach: A study of waves, currents, water temperature, bathymetry, beach profiles, etc., by W. Harrison for CERC.

0065 Patterns of Sediment Dispersion on the Shoreline of an Eroding Barrier Island, Tybee Is., GA: Beach profiles and sediment data collected by George Oertel of Skidaway.

0066 Surface Wave Height Measurements Near the Oregon Coast: Waverider data at 2 sites held by David Halpern, U. of WA.

0067 Effects of Waves on the profile of a Natural Beach, Del Monte Bch., CA: Wave, sediment, and beach morphology data collected by Thompson and Hartlett at the Navy PG school.

0068 Longshore Currents at Nags Head, NC: A study by Galvin and Savage of CERC done in 1964.

0069 Quasi-Weekly and Daily Profile Changes, Monterey, CA: Wave and beach data for Del Monte beach held by W.C. Thompson.

0070 Thailand Trend Micromet: Closely spaced vertical profiles of various meteorological parameters, data held by USAETL.

0071 Antarctic Micromet: Same as 0070.

0072 Wave, Longshore Current, and Beach Profile Data, Oceanside, CA, 1949: Study done by R.L. Wiegel of Berkeley for ONR.

0073 Beach Profiles of Sapelo Island, GA: Done by Orrin Pilkey.

0074 Tidal Cycle of Changes in an Equilibrium Beach, Sandy Hook, NJ: Beach morphology and sediment data collected by A.N. Strahler for ONR.

0075 Coastal Processes on Cape Ann, MA: Sediment and beach data collected by Fox and Cunningham.

0076 The Prediction of Longshore Currents, Oceanside, CA: Wave and current data collected by Walter Munk of Scripps in 1945.

0077 Norwegian Wave Climate Study: Waverider data from 10 sites (locations unavailable).

0078 Spanish Offshore Wave Gauge Network: Pressure sensors at 10-15 sites about 2 miles offshore (locations unknown).

0079 Coastal Wave Gauges-Netherlands: Wind, wave, and tide gauges mounted on pilings; locations unknown.

0080 Longshore Current Observations in Southern California: Data collected by F.P. Shepard at 64 sites in 1946-47.

0081 Coastal Environments, Northeastern Massachusetts and New Hampshire: Beach surveys done by Miles Hayes while at U. Mass.

0082 Sediments of the Merrimack Embayment, Gulf of Maine: Sediment and bathymetry data in dissertation by F.S. Anan of U. Mass.

0083 Longshore Sand Transport on Beaches, Baja California and Coronado, CA: Wave, current, and sediment transport data in Paul Komar's dissertation.

0084 Field Performance of a permeable Breakwater at Va. Beach: A one year study of waves, currents, sediments, beach profiles, and bathymetry by John Ludwick.

0085 Wave Measurements at the Columbia River Light Vessel: Data for 1933-36 analyzed by M.P. O'Brien, U. of Florida. Visual observation.

0086 Nearshore disposal and on shore sediment transport, New River Inlet, NC: Wave, current, wind, profile, and sediment data collected by R.K. Schwartz of CERC.

0087 Surface Temperature and Salinity at Pacific Northwest Stations: 8 coastal sites monitored by Oregon State U.

0088 Beach Processes on the Oregon Coast: beach profiles and some current measurements made by W.T. Fox.

0089 Behavior of Beach Fill, Bridgeport, Ct: Beach and nearshore profile surveys and sediment sampling done by CERC.

0090 Behavior of Beach Fill, Westport, Ct: same as 0089.

0091 General Investigation of Tidal Inlets: CERC investigation of dynamics of several tidal inlets, parameters include waves, currents, tides, bathymetry and beach characteristics.

0092 Behavior of Beach Fill at Harrison County, Miss.: Bathymetric, beach, and sediment surveys done by Corps District, Mobile.

0093 Monitoring of Foredunes on Padre Island, Tx: Beach and dune profiles to monitor effects of beach grass plantings.

0094 Beach Processes at La Jolla, Ca: Waves, currents, bathymetry, sediment, and beaches monitored by D.L.Inman.

0095 Changes in Sand Level at La Jolla, Ca: Bathymetry, sediment, and beaches monitored by D.L. Inman.

0096 Storm induced Beach Erosion in NC: Beach and nearshore profiles at 28 sites (piers) measured by Langfelder of NC State.

0097 Prediction of Beach Volume Changes: Beach profiles on Virginia barrier islands and Va. Beach by Bullock of VIMS.

0098 Beach Profiles Chatham Harbor Beaches, Cape Code: Profiles on Nauset Beach and Monomoy Island by Hine of U. Mass.

0099 Beach Erosion and Accretion Trends at Virginia Beach: VIMS study by Goldsmith, 18 profile lines. Includes analysis of earlier studies 0059 and 0097.

0100 California DNOD Wave Data Network: Pressure gages along Southern California operated by Scripps.

0101 Shore Profiles, Provincetown Harbor, MA: Study by Graham Giese of Center for Coastal Studies, Provincetown. Includes water temperature and salinity.

0102 Beach Profiles, South Truro, MA: Over 4 years of monthly profiles on one transect by Graham Giese of CCS.

0103 Nicaragua Continental Shelf Study: CSI project; includes currents, meteorology, water temperature and salinity, bathymetry, sediments and beach profiles.

0104 Alaskan Arctic Coastal Processes and Geomorphology: CSI study of waves, wind, tide, currents and beach profiles.

0105 Beach Form Changes at Sandy Hook, N.J.: K.F. Nordstrom, CCES, Rutgers U.

0106 Beach and Nearshore Processes at Koeberg, South Africa: Waves, wind, bathymetry, sediment and profiles for 1 yr. Sir William Halcrow and Partners, London.

0107 Suspended Sediment Transport at Price Inlet, S.C.: Waves, currents, and suspended sediments. T.W. Kana, Dept. of Geology, U. of S.C.

0108 Beach Profiles in Los Angeles County, CA: 40 years of profiles out to -50 ft. County Engineers Office.

0109 Morphological Equilibrium of North Inlet, S.C.: Monthly profiles for 1 year. Dept. of Geology, U. of S. Carolina.

0110 Beach Erosion Trends along South Carolina Coast: Historical analysis using charts and photos, and 3 years of profiles. Miles Hayes.

0111 Development of Kiawah Island, S.C.: Monthly profiles for 2.5 years. Miles Hayes.

0112 Sediment Impounded by Offshore Breakwater, Channel Is. Harbor, CA: Waves, currents, winds, bathymetry and beach characteristics. CERC

0113 Tybee Beach Nourishment Project: Beach profiles and bathymetry at Tybee Is., Ga. George Oertel, Skidaway.

0114 Longshore Sediment Transport at Bull Island, S.C.: Sand tracer study, 4 runs. Dept. of Geology, U. of S.C.

0115 Rhythmic Patterns of Beach Topography at Sea Grove, FL: Waves, tide, currents, wind, and profiles; 3 weeks. CSI.

0116 Surinam Muddy Coast Study: Waves, tides, currents, turbidity, and sub-bottom pressures. CSI.

0117 Bayside Beach Dynamics at Sandy Hook, N.J.: Comparison of processes on ocean and bay sides of spit. Nordstrom, CCES, Rutgers U.

0118 SALIS Project on Santa Rosa Island, Florida: Sea-air-land interaction system project. CSI.

0119 Nearshore Processes in a Fore-reef Shelf Environment: Waves, tides, currents, bathymetry, and meteorology on Grand Cayman and Barbados. CSI.

0120 University of Florida Coastal Data Network: Wave gauges tied to central computer at C.O.E.L., University of Florida.

0121 Sand Movement in Relation to Beach Topography, Shell Is., FL: Tracer experiment, 3 runs. CSI.

0122 Coastal Processes on the Northeast Coast of Brazil: CSI field study of dynamics and morphology.

0123 NOS Secondary Tide Stations: NOAA tide stations that operated for 12 months or longer to establish bench marks.

0124 Geomorphic Changes on a Breached Spit, Nauset, Mass.: Sediment analysis and beach surveys.

0125 Erosion Control on a High-Energy Coast: Beach nourishment and surveys on Ediz Hook, Washington, by Seattle District.

0126 Southwest Ocean Outfall Project, San Francisco: Oceanographic and geotechnical surveys of planned site.

0127 Environmental Impact Study for Harbor in Persian Gulf: Sir William Halcrow and Partners; waves, currents, sediments, and morphology.

0128 Sediment Transport Field Study Program (Connecticut): Waves, currents, sediments, and bathymetry by Stone & Webster.

0129 Beach Morphology and Nearshore Processes on Napatree Beach, R.I.: Process-response study.

0130 Beach and Nearshore Dynamics in the Magdalen Islands: Process response study by CSI.

0131 Beach Profiles on the Oregon and Washington Coast: Profiles made from a DUKW in 1945-46 by Bascom and Isaacs.

0132 Beach Restoration Project, Jupiter Island, Florida: Monitored waves, tides, currents, wind, bathymetry, sediments, and the beach shape.

0133 Beach Haven and Little Egg Inlet Studies: Dames and Moore.

Model File Inventory - Type 3 Records

Record	Model
9999-001	Bar simulation model: Simulates formation of nearshore bars. W.N. Felder.
9999-002	Sea breeze refraction model: Produces nearshore circulation streamlines allowing for wave-current interaction.
9999-003	Three dimensional sea breeze model: Numerical modeling of sea breezes over south Florida.
9999-004	Delta growth model: Simulates delta formation.
9999-005	Dobson wave refraction model.
9999-006	SPITSYM: Simulates growth of a spit.
9999-007	Shoreline model: Fox and Davis simulation model for storm cycles and beach erosion.
9999-008	SPLASH: Storm surge prediction model.
9999-009	Sediment transport model.
9999-010	Bathystrophic storm surge model.
9999-011	Energy spectrum transformation model: Wave spectrum transformation over an irregular bottom.

APPENDIX H

Coding Instructions for UVAIS1

Data Catalogue Instructions

Model Catalogue Instructions

Coding Table

Input Coding Instructions for the UVA Coastal Data and Model Inventory File:

SHARP File UVAIS1

Contents:

I. General coding instructions.

II. Data inventory coding instructions for each data element.

III. Model inventory coding instruction for each data element.

IV. Table of Codes for all Coded Elements.

I. UVAIS1 General Coding Instructions

1. Columns 1-72 of each card are used for data entry. The first column of each card must be filled.
2. Start each new record with an A in cc1 (card column 1) followed by a space and the record ID number.
   Example: A 0015-036
3. After the record ID, the data elements contained in a given record can be entered in any order, however for ease in checking for missing elements, it is best to enter them in numerical order whenever possible. Use as many cards as necessary to complete the record but enter the record ID only on the first card.
4. To code a data element (except the record ID), first enter the data element number followed by a right parenthesis. Enter the actual data after the parenthesis. There must be at least one blank space before each data element number. If an element contains multiple data entries, they should be separated by semi-colons.
   Example: 7)01;03;13 9)3;5 10)1
5. Continuation cards:
   a) When you have coded through cc72 and are not at the end of a data element, continue with the next character (not a blank) in cc 1 of the next card.
      Example: ....7)01;3
      0;32..................

AD-A062 608 VIRGINIA UNIV CHARLOTTESVILLE DEPT OF ENVIRONMENTAL --ETC F/G 8/6
UNIVERSITY OF VIRGINIA COASTAL INFORMATION SYSTEM: DESIGN OF A --ETC(U)
NOV 78 C C REA, R DOLAN, B HAYDEN, P ROSS N00014-75-C-0480

UNCLASSIFIED TR-20 NL

2 OF 2
ADA
062608

END
DATE
FILMED
3 -79
DDC

b) When entering a textual, i.e. free format (not coded), element, you cannot end a word in cc 72 because the next character would normally be a blank space which is not permissible in cc 1 of the next card. Likewise you cannot end a data element in cc 72 because the next character is a blank which must precede the next data element number.

c) When either of the situations in b occurs, you have two options: 1) shift the offending data element to the next card.

```
Example:  1                 72        1                 72
incorrect:|....32)US 33)NAT|  correct:|...... 32)US      |
          |34)2........    |          |33)NAT 34)2......|
```

2) Use a double dollar sign ($$) to terminate the offending element at an appropriate position prior to cc 71 and continue with the remainder of the element in cc 1 of the next card.

```
Example:       1                 72        1                 72
incorrect:     |....21)THIS SITE|  correct:|....21)THIS $$   |
               |WAS.............|          |SITE WAS........ |
also correct:  |....21)THIS SI$$|          |                 |
               |TE WAS..........|          |                 |
incorrect:     |.........48)0301|  correct:|..........48)03$$|
               |49)03001 .......|          |01 49)03001..... |
also correct:  |.........48)$$  |
               |0301 49)03001...|
```

6. End each record with "$END". The "$END" must be preceded by at least one blank space, and it must not end in cc 72.

II. Data Inventory:

Data Element Coding Instructions.

Note: cc = card columns; "repeat" means that multiple entries separated by semi-colons are allowed. "Max 6 cc" means that a data entry may be up to 6 card columns long; "6 cc" means that 6 columns must be filled.

0) RCDID (record ID): 4 or 8 cc. Characters 1-4 are a 4-digit serial number assigned to Type 1 records. Type 2 records are identified by the ID number of their related TYPE 1 record plus a hyphen (char. 5) and an additional 3-digit serial number (chars. 6-8).

Example: 0023-013

2) PROC/DATE (processing date): Date of last update of a record. This is supplied automatically by the SHARP system and should not be input.

3) INFODATE(information date): 2 or 4 cc. Date (YYMMDD) of the latest information used to produce a record. For old studies this could be the date of verification of the continued existence of the data.

4) STUDY (study name): Max 60 cc. Name given to the study or data file by the investigator or holder of the data.

5) STUDY-TYPE: 1 cc, repeat. Select a code from the following table.

1 SITE SPECIFIC
2 DATA SUMMARY
3 LONG TIME-SERIES
4 SYNOPTIC SCALE
5 MODEL

6) DATA-TYPE: 1 cc, repeat. Select a code from the following table.

1 REAL
2 SYNTHETIC
3 REAL AND SYNTHETIC
4 SEE REMARKS

7) Parameter: 2 cc, repeat. Select 2-digit codes from the following table for the general types of parameters measured in the study.

01 WAVES
02 TIDES
03 CURRENTS
04 WIND
11 WATER TEMPERATURE
12 SALINITY
13 WATER DENSITY
21 AIR TEMPERATURE
22 BAROMETRIC PRESSURE
23 PRECIPITATION
24 DEW POINT
25 VISIBILITY
26 SOLAR RADIATION
30 BATHYMETRY
31 SEDIMENTS
32 BEACH MORPHOLOGY

8) MEDIUM (data storage medium): 1 cc, repeat. Select codes from the following table.

0 UNKNOWN
1 MAGNETIC TAPE
2 PUNCHED CARDS
3 PUNCHED PAPER TAPE
4 STRIP CHARTS
5 DATA SHEETS
6 REPORTS/PUBLICATIONS
7 MAPS/CHARTS
8 MICROFICHE/FILM
9 SEE REMARKS

9) DATA-AVAL (Availability of the data) 1 cc, repeat. Select a code from the following table.

0 UNKNOWN
1 FREE ON REQUEST
2 COST OF RETRIEVAL/REPRODUCTION
3 PERMISSION OF INVESTIGATOR
4 ONSITE USE ONLY
5 PUBLISHED
6 SUBSCRIPTION
9 SEE REMARKS

10) ANALYSES: 1 cc. Select a code from the following table.

1 DATA HAVE BEEN ANALYZED, SEE REMARKS
2 DATA HAVE NOT BEEN ANALYZED
3 STATE OF DATA ANALYSIS IS UNKNOWN

11) TYP2RCDS (Type 2 records): Max 3 cc. Enter the number of Type 2 records associated with the TYPE 1 record being input. Normally this should be entered as a change to the TYPE 1 record after all the related Type 2 records have been coded.

Example: C 0001 11)75 $END

12) CONTACT: Max 60 cc. Name of person or department to contact in order to obtain the data.

13) CONINST (contact institution): Max 60 cc. Department, agency, or institution of the contact entered in element 12.

14) CONADD (contract address): Max 60 cc. Agency, institution or street address of the contact entered in element 12.

15) CONSTAT (Contact state): Max 60 cc. City,state, zip code, and country of the contact.

16) TELEPHONE: Max 13 cc. Enter the telephone number of the contact if known.

17) PUBLICATNS (publications): Max 60 cc, repeat. Enter publications or other references pertaining to or containing the data. If a reference required more than 60 columns, continue it in additional entries

in the same manner that it would be continued on successive lines. In other words, consider the semi-colons separating entries as marking the end of one line and the beginning of the next. To make the output more readable, number each reference in the first column of a new entry.

Example:

(input) . . . 17)1. SMITH, A.J., 1976. . . .;V. 3, p. 84-91.;2. JONES, B.K., 1972. . . .;p. 1124-1157.

(output)1. SMITH, A.J., 1976. . . . . .

v. 3, p. 84-91.

2. JONES, B.K., 1972. . . . . .

p. 1124-1157.

18) SOURCES: Max 60 cc, repeat. Enter sources of information used to generate a record. The date of the latest source will usually be entered in element #3. Source information is for our use in updating records, therefore anything that might be useful, such as telephone conversation or correspondence with agencies or individuals, should be included. Also include the name of the in-house researcher. Use the same coding procedures prescribed for element #17.

19) SPONSOR: Max 60 cc. Enter the name of the agency funding the research study.

20) PI (Principal Investigator): Max 60 cc. Enter the name and address of the principal investigator.

21) REMARKS: Max 1500 cc. Enter a brief description of the study and any additional useful information such as the types of analyses made of the data, brand names of instruments, etc. Be sure to comment on any data element in which "see remarks" was entered.

22) SITES: Max 3 cc. Enter the number of data collection sites associated with the study. Note that this number should be less than or equal to the number of Type 2 records entered in element #11.

29) Latitude: 7 cc, repeat.
Enter the latitude of the data collection site.
Example: 241600N

30) Longitude: 8 cc, repeat.
Enter the longitude of the data collection site.
To describe a large area such as might be covered by a remote sensing platform, draw a polygon around the area and enter the coordinates of the corners.

Examples: 1273500W

31) AREA: Max 10 cc, repeat. Enter the WMO (World Meteorological Organization) code for the 10°, 1°, 10', or 1' rectangles containing the area or site of data collection. The WMO code is derived from the geographic coordinates of the lowest order corner of the rectangle. The first digit is a 1,3,5, or 7 which corresponds respectively to the NE,SE,SW, or NW quadrant of the globe. The next 3 digits are the 10° latitude digit followed by the two 10° longitide digits. This 4 digit code is the minimum required; it references a 10° rectangle. The WMO code can be expanded to 6,8, or 10 digits to reference 1°, 10' or 1' rectangles respectively. Each successive pair of digits is composed of 1 digit from the latitude and 1 from the longitude. The WMO code always references a rectangle through the coordinate of its lowest-order corner. In the NW quadrant, the coordinates of the southeast corner of a rectangle are used to form the WMO code for that rectangle.

Examples:

geographic coordinates	WMO code	rectangle
354618N/1185320W	7311584563	1 minute
45N/070W	750750	1 degree
40N/070W	740700	1 degree
or	7407	10 degree

32) COUNTRY: 2 cc. Enter the appropriate 2-letter country code for the country in which the collection site is located. For offshore sites give the controlling country or country of the nearest land.

CA CANADA US UNITED STATES	See coding table for additional country codes.

33) OCEAN: 3 cc. Enter the appropriate 3-letter code for the body of water on which the site is located.

NAT NORTH ATLANTIC NPC NORTH PACIFIC GMX GULF OF MEXICO	See coding table for additional ocean codes.

34) AXSHORE (across-the-shore): 1 cc, repeat. Enter a code or codes from the following table to indicate the position of the site on a transect perpendicular to the coast.

1 ONSHORE
2 NEARSHORE
3 OFFSHORE

35) DEPTH: Max 3 cc. Enter the depth to the nearest meter at the collection site.

36) PLACE: Max 60 cc. Enter the name of the town or other geographic feature nearest to the collection site.

37) SITE: Max 60 cc. Enter a description of the actual measurement site such as the location of a gauge on a pier or light tower or the range and bearing from some point on shore for offshore sites.

38) STATUS: 1 cc. Enter a code from the following table for the present status of the collection site.

0 UNKNOWN	2 TEMPORARILY INACTIVE
1 ACTIVE	3 DISCONTINUED

Elements 39-43 are related and should all contain the same number of entries in a given record. An exception is made if a site is still active, in which case the last entry in element 41 (stop-date) is omitted, and the last entry in 42 (length) gives the duration up to the date of information or date of coding.

Elements 44-49 are also related and should all contain the same number of entries in a given record. These two sets of related elements (39-43 and 44-49) are output in table format. Particular attention must be paid to the order of the data entries in these elements so that the data will be in the proper columns when output.

```
EXAMPLE:

INPUT:  39)1;2;3 40)7312;7508;7511 41)7506;7511 42)150;67;108
        43)0;0;0 44)1-3;3;1-2;1-3;1-3;1-2 47)8/DAY;8/DAY;8/DAY;
        8/DAY;8/DAY;8/DAY 48)1101;1102;1201;2101;2201;2301 49)1
        1004;11005;12002;21001;22002;23001

OUTPUT:

PERIOD/NO: 1           2           3
STARTDATE: DEC 73      AUG 75      NOV 75
STOP-DATE: JUN 75      NOV 75
LENGTH/YR:       1.50        .67         1.08
DATA-GAPS: UNKNOWN     UNKNOWN     UNKNOWN

PERIODS: 1-3                       3                     1-2
RCD-FREQ: 8/DAY                     8/DAY                 8/DAY
VARIABLE: SEA SURFACE TEMP.     SUBSURFACE TEMP.      SURFACE SALINITY
METHOD: RESISTANCE THERMOM.    THERMISTOR            CONDUCTIVITY

         1-3                       1-3                   1-2
          8/DAY                     8/DAY                 8/DAY
          SEA LEVEL AIR TEMP.   SL BAROM. PRESSURE    SEA LEVEL PRECIP.
        RESISTANCE THERMOM.    CAPACITY DIAPHRAGM    RAIN GAGE
```

39) PERIOD/NO: 1 cc, repeat. Assign a 1-digit serial number to each separate period of operation. Operational periods are bounded by periods of no data collection or by changes in the percentage of gaps in the record (element #43), the frequency of observations (elements #45, 46, 47), the variable observed (element #48), or the method of observation (element #49).

40) STARTDATE: Max 6 cc, repeat. List the starting dates (YYMMDD) for each separate period of operation identified in element #39. Non-20th century dates can be entered since the century does not appear in the output; however they should be noted in remarks.

41) STOP-DATE: Max 6 cc, repeat. List the end dates of each period of operation identified in element #39 except that the end date of the last period is omitted if the site is currently operating.

42) LENGTH/YR: Max 8 cc, repeat. List the length in years to hundredths of each period of operation in element #39. For operating sites, the duration of the last period should be up to the date of coding. The decimal point is optional; the system will assume two decimal places.

43) GAPS: 1 cc, repeat. For each operating period in element #39, enter a code from the following table for the percentage of gaps in the data record. Gaps are defined as lapses in the measurement pattern described by elements #45, 46, and 47.

0 UNKNOWN
1 0-10 PCT
2 11-20 PCT
3 21-30 PCT
4 31-40 PCT
5 41-50 PCT
6 GT 50 PCT

44) PERIODS: Max 11 cc, repeat. Specify the operating periods in element #39 that apply to the information in elements 45-49. For example, suppose there are 4 operating periods and 2 variables with one variable being measured during all 4 periods and the other measured only during periods 1,2, and 4. The input would be: 39)1;2;3;4 44) 1-4;1-2,4 48)0103; 0106

45) DATAFREQ (data digitizing frequency): Max 10 cc, repeat. Enter the data digitizing frequency for the operating periods specified in element #44 and the variables and methods entered in elements 48 and 49. For example if the digitizing interval is 1/4 second, enter "4/SEC" as the data frequency.

46) RECORDLNG (record length): Max 9 cc, repeat. Enter the length of time during which data are recorded during a single observation for the operating periods specified in element #44 and the variables and methods in 48 and 49.

47) RECORDFREQ (record frequency): Max 10 cc, repeat. Enter the frequency of data recordings for the operating periods specified in element #44 and the variables and methods in 48 and 49.

48) VARIABLE: Max 4 cc, repeat. Enter appropriate codes from the coding table for the variables measured during the operating periods specified in element #44. Note that the first 2 digits of the variable code repeat the general parameter code used in element #7; the last 2 digits identify the particular aspect of the general parameter that was actually measured, e.g., "wave height" or "current speed."

49) METHOD: Max 5 cc, repeat. Enter appropriate codes from the coding table for the methods of measuring the variable(s) in element #48 during the operating periods(s) specified in element #44. Note that the first 2 digits repeat the general parameter code used in element #7 and the last 3 digits identify the particular method used.

50) RCD-TYPE (record type): 1 cc. Enter a code from the following table for the type of record based on the class of parameter(s) measured, the quality of the data. As a general guideline, observations of dynamic variables covering a period of less than 10-11 months should be classified as "complementary."

1 PRIMARY
2 SECONDARY
3 COMPLEMENTARY

III. Model Inventory

Data Element Coding Instructions

0) RCDID (record ID): 8 cc. Enter 9999- in characters 1-5 and a three digit serial number in characters 6-8.

2) PROC/DATE (processing date): Date of the last update of a record. This is supplied automatically by the SHARP system and should not be input.

3) INFODATE (information date): 2 or 4 cc. Date of the latest information used to produce a record entered in the format year/month (YYMM).

4) MODEL (model name): Max 60 cc. Name given to the model by its inventor.

5) STUDY-TYPE: 1 cc. Enter the single digit 5 to indicate that the record pertains to a model.

7) PARAMETER: 2 cc, repeat. Select 2-digit codes from the following table for the general types of parameters output by the model.

01 WAVES	21 AIR TEMPERATURE
02 TIDES	22 BAROMETRIC PRESSURE
03 CURRENTS	23 PRECIPITATION
04 WIND	24 DEW POINT
11 WATER TEMPERATURE	25 VISIBILITY
12 SALINITY	26 SOLAR RADIATION
13 WATER DENSITY	30 BATHYMETRY
	31 SEDIMENTS
	32 BEACH MORPHOLOGY

9) AVALBILTY (Availability of the model): 1 cc, repeat. Select a code from the following table.

0 UNKNOWN	5 PUBLISHED
1 FREE ON REQUEST	6 SUBSCRIPTION
2 COST OF RETRIEVAL/REPRODUCTION	9 SEE REMARKS
3 PERMISSION OF INVESTIGATOR	
4 ONSITE USE ONLY	

12) CONTACT: Max 60 cc. Name of person or department to contact in order to obtain the model.

13) CONINST (contact institution): Max 60 cc. Department, agency, or institution of the contact entered in element 12.

14) CONADD (contact address): Max 60 cc. Agency, institution, or street address of the contact entered in element 12.

15) CONSTAT (Contact state): Max 60 cc. City, state, zip code, and country of the contact.

16) TELEPHONE: Max 13 cc. Enter the telephone number of the contact if known.

17) PUBLICATNS (publications): Max 60 cc, repeat. Enter publications or other references pertaining to or containing the model. If a reference requires more than 60 columns, continue it in additional entries in the same manner that it would be continued on successive lines. In other words, consider the semi-colons separating entries as marking the end of one line and the beginning of the next. To make the output more readable, number each reference in the first column of a new entry.

Example:

(input) . . . 17)1. SMITH, A.J., 1976 . . . . ; V. 3, p. 84-91.;2. JONES, B.K., 1972. . . . ; p. 1124-1157.

(output)1. SMITH, A.J., 1976. . . . .

v. 3, p. 84-91.

2. JONES, B.K., 1972. . . . . .

p. 1124-1157.

18) SOURCES: Max 60 cc, repeat. Enter sources of information used to generate a record. The date of the latest source will usually be entered in element #3. Source information is for our use in updating records, therefore anything that might be useful, such as telephone conversation or correspondence with agencies or individuals, should be included. Also include the name of the in-house researcher. Use the same coding procedures prescribed for element #17.

19) SPONSOR: Max 60 cc. Enter the name of the agency funding the development of the model.

20) PI (Principal Investigator): Max 60 cc. Enter the name and address of the principal investigator.

Elements 34 - 37 are used only if the model pertains to a particular site.

34) AXSHORE (across-the-shore): 1 cc, repeat. Enter a code or codes from the following table to indicate the position of the site on a transect perpendicular to the coast.

1 ONSHORE

2 NEARSHORE

3 OFFSHORE

35) DEPTH: Max 3 cc. Enter the depth to the nearest meter at the model site.

36) PLACE: Max 60 cc. Enter the name of the town or other geographic feature nearest to the model site.

37) SITE: Max 60 cc. Enter a description of the actual model site such as its location relative to local landmarks (pier, light tower, headland, inlet, etc.).

48) VARIABLE: Max 4 cc, repeat. Enter appropriate codes from the coding table for the variables measured during the operating periods specified in element #44. Note that the first 2 digits of the variable code repeat the general parameter code used in element #7; the last 2 digits identify the particular aspect of the general parameter that was actually measured, e.g., "wave height" or "current speed."

61) MODEL-TYP: Max 2 cc. Enter one of the following codes.

0 UNKNOWN	4 PHYSICAL	8 MIXED, SEE REMARKS
1 SEE REMARKS	5 STATISTICAL	
2 NUMERICAL	6 GRAPHIC	
3 SIMULATION	7 MATHEMATICAL	

62) HRDWR-TYP: Max 2 cc. ENTER ONE OF THE FOLLOWING CODES

0 UNKNOWN	3 DIGITAL	6 MANUAL
1 SEE REMARKS	4 ANALOG	
2 NOT APPLICABLE	5 HYBRID	

63) COMPUTER: Max 60 cc, REPEAT. ENTER NAME(S) OF COMPUTER(S) ON WHICH THE MODEL HAS RUN.

64) SORC-LANG (SOURCE LANGUAGE): Max 2 cc, REPEAT. ENTER CODE(S) FROM THE FOLLOWING TABLE.

0 UNKNOWN	2 FORTRAN
1 SEE REMARKS	

65) OUT-MODE (OUTPUT MODE): Max 2, REPEAT.

ENTER CODE(S) FROM THE FOLLOWING TABLE.

0 UNKNOWN
1 SEE REMARKS
2 LINE PRINTER
3 CRT DISPLAY

66) USABILITY: Max 2 cc. ENTER ONE OF THE FOLLOWING CODES.

0	UNTESTED	3	REQUIRES SOME PROGRAMMING
1	SEE REMARKS	4	EASILY IMPLEMENTED
2	REQUIRES MUCH PROGRAMMING	5	FULLY OPERATIONAL

67) TIME-STEP: Max 23. ENTER TIME STEP RANGE OF MAXIMUM UTILITY. EXAMPLE: 67) HOURS - DAYS

68) SPAC-SCAL: Max 23. ENTER RANGE OF GRID SQUARE DIMENSIONS OF MAXIMUM UTILITY.

EXAMPLE: 68) 10-100 METERS

69) IN-GRID: Max 25. ENTER NUMBER OF DIMENSIONS IN THE INPUT GRID. EXAMPLE: 69) 2 DIMENSIONAL

70) IN-AXES: Max 25, REPEAT. ENTER NAMES OF INPUT GRID AXES. EXAMPLE: 70) ALONGSHORE; ACROSS THE SHORE

71) IN-PATTRN: Max 25. ENTER TYPE OF INPUT GRID PATTERN.

EXAMPLE: 71) RECTANGULAR

72) IN-VARIBL: Max 23, REPEAT. ENTER INPUT VARIABLE(S),

73) IN-CONST.: Max 23, REPEAT. ENTER INPUT CONSTANT(S).

EXAMPLE: 73) TIME STEP; GRID SQUARE DIMENSION; DEEP WATER WAVE HEIGHT.

Elements 74-78 are identical to 69-73 respectively except that the information required applies to output rather than input.

74) OUT-GRID (OUTPUT GRID DIMENSION): Max 25. SEE #69.

75) OUT-AXES (OUTPUT GRID AXES): Max 25, REPEAT. SEE #70.

76) OUT-PATRN (OUTPUT PATTERN): Max 23. SEE # 71.

77) OUT-VARBL (OUTPUT VARIABLES): Max 23, REPEAT. SEE # 72.

78) OUT-CONST (OUTPUT CONSTANTS): Max 23, REPEAT. SEE # 73.

79) CALIBRATN (CALIBRATION PROCEDURE): Max 1500.

DESCRIBE CALIBRATION REQUIREMENTS OF THE MODEL.

21) REMARKS: Max 2000 cc. ENTER A BRIEF DESCRIPTION OF THE MODEL AND ANY ADDITIONAL USEFUL INFORMATION. BE SURE TO COMMENT ON ANY DATA ELEMENTS IN WHICH "SEE REMARKS" WAS ENTERED.

IV. Table of Codes (May 2, 1978)

STUDY-TYPE
1 SITE SPECIFIC;
2 DATA SUMMARY;
3 LONG TIME-SERIES;
4 SYNOPTIC SCALE;
5 MODEL;

DATA-TYPE
1 REAL;
2 SYNTHETIC;
3 REAL AND SYNTHETIC;
4 SEE REMARKS;

PARAMETER
01 WAVES;
02 TIDES;
03 CURRENTS;
04 WIND;
11 WATER TEMPERATURE;
12 SALINITY;
13 WATER DENSITY;
20 STORMS;
21 AIR TEMPERATURE;
22 BAROMETRIC PRESSURE;
23 PRECIPITATION;
24 DEW POINT;
25 VISIBILITY;
26 SOLAR RADIATION;
27 TEMP. OF SUBSTRATE;
30 BATHYMETRY;
31 SEDIMENTS;
32 BEACH MORPHOLOGY;
33 BCH CHARACTERISTICS;

MEDIUM
0 UNKNOWN;
1 MAGNETIC TAPE;
2 PUNCHED CARDS;
3 PUNCHED PAPER TAPE;
4 STRIP CHARTS;
5 DATA SHEETS
6 REPORTS/PUBLICATIONS;
7 MAPS/CHARTS;
8 MICROFORM;
9 SEE REMARKS;

AVAILABLTY
0 UNKNOWN;
1 FREE ON REQUEST;
2 COST OF RETRIEVAL/REPRODUCTION;
3 PERMISSION OF INVESTIGATOR;
4 ONSITE USE ONLY;
5 PUBLISHED;
6 SUBSCRIPTION;
7 COMPUTER COST;
9 SEE REMARKS;

ANALYSES
1 DATA HAVE BEEN ANALYZED, SEE REMARKS;
2 DATA HAVE NOT BEEN ANALYZED;
3 STATE OF DATA ANALYSIS IS UNKNOWN;

COUNTRY
AQ AMERICAN SAMOA;
AY ANTARCTICA;
BF BAHAMAS;
BB BARBADOS;
BD BERMUDA;
BR BRAZIL;
VI BRITISH VIRGIN IS.;
CA CANADA;
EQ CANTON ISLAND;
CJ CAYMAN ISLANDS;
KT CHRISTMAS ISLAND;
CU CUBA;
UK GREAT BRITAIN;
GJ GRENADA;
GP GUADELOUPE;
GQ GUAM ISLAND;
GY GUYANA;
JQ JOHNSTON ATOLL;
LY LIBYA;
MB MARTINIQUE;
MX MEXICO;
MQ MIDWAY ISLAND;
NL NETHERLANDS;
PP PAPUA/NEW GUINEA;
NU NICARAGUA;
NO NORWAY;
RQ PUERTO RICO;
ST ST. LUCIA;
VC ST. VINCENT;
SF SOUTH AFRICA;
UR SOVIET UNION;
SP SPAIN;
NS SURINAM;
TH THAILAND;

COUNTRY (continued)
TD TRINIDAD AND TOBAGO;
TC UNITED ARAB EMIRATES;
US UNITED STATES;
IQ US MISC PACIFIC IS;
VQ VIRGIN ISLANDS;
WQ WAKE ISLAND;

OCEAN
ARC ARCTIC OCEAN;
CBB CARIBBEAN SEA;
GCA GULF OF CALIFORNIA;
GMX GULF OF MEXICO;
MED MEDITERRANEAN;
NAT NORTH ATLANTIC;
NPC NORTH PACIFIC;
NTH NORTH SEA;
PNG PERSIAN GULF;
SAT SOUTH ATLANTIC;
SPC SOUTH PACIFIC;

AXSHOR
1 ONSHORE;
2 NEARSHORE;
3 OFFSHORE;

STATUS
0 UNKNOWN;
1 ACTIVE;
2 TEMPORARILY INACTIVE;
3 DISCONTINUED;

GAPS
0 UNKNOWN;
1 0-10 PCT;
2 11-20 PCT;
3 21-30 PCT;
4 31-40 PCT;
5 41-50 PCT;
6 GT 50 PCT;

VARIABLE
0100 WAVES;
0101 WAVE HEIGHT;
0102 WAVE PERIOD;
0103 WAVE AMPLITUDE;
0104 WAVE ENERGY;
0105 WAVE POWER;
0106 WAVE DIRECTION;
0107 SURF/BREAKER HEIGHT;
0108 SURF/BREAKER PERIOD;
0109 SURF ZONE WIDTH;
0110 SURF DIST. OFFSHORE;
0111 BREAKER TYPE;
0112 SIGNIFICANT WAVE HT;
0113 WAVE HEIGHT SPECTRA;
0114 BREAKER ANGLE;
0115 WAVE SWASH VELOCITY;
0116 WAVE SWASH POSITION;
0117 BREAKING DEPTH;
0118 WAVE LENGTH;
0119 TOTAL WAVE ENERGY;
0120 WAVE ENERGY SPECTRA;
0121 INFRAGRAVITY WAVES;
0200 TIDES;
0201 TIMES HI + LO TIDE;
0202 HT OF HI + LO TIDE;
0203 CONTINUOUS TIDE RCD;
0204 WATER/TIDE LEVEL;
0300 CURRENTS;
0301 LONGSHORE CURR SPD;
0302 LONGSHORE CURR DIR;
0303 SURFACE CURRENT SPD;
0304 SURFACE CURRENT DIR;
0305 CURRENT PROFILE;
0310 TIDAL CURRENT SPEED;
0311 TIDAL CURR DIR.;
0315 RIP CURRENT SPEED;
0316 RIP CURRENT SPACING;
0317 BOTTOM CURRENT SPD;
0318 BOTTOM CURRENT DIR;
0400 WIND;
0401 SURFACE WIND SPEED;
0402 SURFACE WIND DIR.;
0403 WIND FORCE;
0404 WIND SPEED PROFILE;
0405 WIND DIR. PROFILE;
1100 WATER TEMPERATURE;
1101 SEA SURFACE TEMP.;
1102 SUBSURFACE TEMP.;
1103 WATER TEMP PROFILE;
1104 BOTTOM WATER TEMP.;
1200 SALINITY;
1201 SURFACE SALINITY;
1202 SUBSURFACE SALINITY;
1203 BOTTOM SALINITY;
1204 SALINITY PROFILE;
1300 WATER DENSITY;
1301 SURFACE WTR DENSITY;
2000 STORMS;
2001 STORM TRACK;
2002 STORM LANDFALL;
2003 STORM SURGE;
2004 RADIUS OF MAX WINDS;
2005 STORM FORWARD SPEED;
2006 DIRECTION OF MOTION;
2007 STORM FREQUENCY;
2008 CENTRAL PRESSURE;

VARIABLE (continued)	METHOD
2009 STRM LATERAL EXTENT;	0 UNKNOWN;
2010 STORM VERT. EXTENT;	1 SEE REMARKS;
2100 AIR TEMPERATURE;	01001 VISUAL ESTIMATE;
2101 SURFACE AIR TEMP.;	01002 FIXED STAFF, VISUAL;
2102 AIR TEMP PROFILE;	01003 PRESSURE GAGE;
2200 BAROMETRIC PRESSURE;	01004 STEP RESISTANCE GAGE;
2201 SL BAROM. PRESSURE;	01005 STEP CAPAC. GAGE;
2300 PRECIPITATION;	01006 PARALLEL WIRE INDUCT;
2301 SURFACE PRECIP.;	01007 VERTICAL ACCELEROMTR;
2302 PRECIP. INTENSITY;	01008 THERMOPILE;
2303 PRECIP. TYPE;	01009 HINDCAST;
2304 PRECIP. CHARACTER;	01010 COMPASS;
2305 PRECIP AT ALTITUDE;	01011 PROTRACTOR:
2400 DEW POINT;	01012 THEODOLITE;
2401 SURFACE DEW POINT;	01013 WAVE GAGE ARRAY;
2402 DEWPOINT PROFILE;	01014 2-DIMEN. GAGE ARRAY;
2500 ATMOSPHERIC VIS.;	01015 LINEAR GAGE ARRAY;
2501 SURFACE VISIBILITY;	01016 HORIZ. ACCELEROMETER;
2600 SOLAR RADIATION;	01017 TIMING DEVICE;
2601 SOLAR RAD. AT SL;	01018 TIMED NO. OF CRESTS;
2602 NET SOLAR RADIATION;	01019 SEISMOMETER;
2700 TEMP. OF SUBSTRATE;	01020 VIBRO PRESSURE GAGE;
2701 SUBSFC TEMP PROFILE;	01021 S-M-B HINDCAST;
2702 GROUND SURFACE TEMP;	01022 NUMERICAL MODEL;
3000 BATHYMETRY;	01023 TIMED SWASH ADVANCE;
3001 SPOT DEPTH SOUNDING;	01024 HANDHELD ROD, VISUAL;
3002 TRACK LINE BATHYMET;	01025 TRANSIT;
3003 NEARSH DEPTH PROFIL;	01026 PELORUS;
3004 BATHYMETRIC SURVEY;	01027 SURFACE SLOPE ARRAY;
3005 NEARSHORE SLOPE;	01028 RESISTANCE WIRE GAGE;
3100 SEDIMENTS;	02001 FLOAT GAGE;
3101 BOTTOM SED. SIZE;	02002 BUBBLER GAGE;
3102 BEACH SEDIMENT SIZE;	02003 FIXED STAFF, VISUAL;
3103 BOTTOM SED MINERALS;	02004 PREDICTION MODEL;
3104 BEACH SED. MINERALS;	02005 ADR FLOAT GAGE;
3105 BOTTOM SED. SAMPLE;	02006 CAPACITANCE GAGE;
3106 BEACH SED. SAMPLE;	02007 PRESSURE GAGE;
3107 BOTTOM CHARACTER;	03001 VISUAL ESTIMATE;
3108 SEDIMENT TRANSPORT;	03002 SURFACE DRIFTER;
3109 SUSPEND. SED SAMPLE;	03003 MID-DEPTH DRIFTER;
3110 SUSPENDED SED. SIZE;	03004 BOTTOM DRIFTER;
3111 DUNE SED. SAMPLE;	03005 DYE PATCH;
3112 DUNE SEDIMENT SIZE;	03006 SAVONIUS ROTOR;
3113 TURBIDITY;	03007 IMPELLOR;
3114 BOTTOM SED. DENSITY;	03008 ELECTRO-MAG METER;
3200 BEACH MORPHOLOGY;	03009 2-COMP ELEC-MAG MTR;
3201 BEACH FORESHR SLOPE;	03010 COMPASS;
3202 BEACH BACKSHR SLOPE;	03011 CURRENT DROGUE;
3203 BERM FACE SLOPE;	03012 PROFILING CURR. MTR.;
3204 BEACH CUSP SPACING;	04001 IMPELLOR ANEMOMETER;
3205 BEACH PROFILE;	04002 SAVONIUS ROTOR;
3206 BEACH PLAN SHAPE;	04003 DIRECTION VANE;
	04004 ESTIMATE;

METHOD (continued)

04005 RAM-AIR-PRESSURE MTR;
04006 VORTEX FREQUENCY MTR;
04007 TRIPLE REGISTER;
04008 WIND RECORDER;
04009 CUP ANEMOMETER;
11001 MERCURY THERMOMETER;
11002 REVERSING THERMOM.;
11003 IR RADIATION THERMOM;
11004 RESISTANCE THERMOM.;
11005 THERMISTOR;
11006 BATHYTHERMOGRAPH;
11007 BUCKET SAMPLE;
11009 AIR-SEA THERMOGRAPH;
11010 2 LEVEL THERMOGRAPH;
11008 STD PROFILER;
12001 TITRATION;
12002 CONDUCTIVITY;
12003 SALINOMETER;
12004 HYDROMETER;
12005 STD PROFILER;
13001 HYDROMTR AT STD TEMP;
20001 PROBABILITY MODEL;
20002 NUMERICAL MODEL;
20003 WEATHER RADAR;
21001 RESISTANCE THERMOM.;
21002 THERMOGRAM;
21003 THERMISTOR;
21004 MERCURY THERMOMETER;
21005 AIR-SEA THERMOGRAPH;
22001 ANEROID BAROMETER
22002 CAPACITY DIAPHRAGM;
22003 ELECTRO-BAROMETER;
22004 BAROGRAPH;
22005 MICROBAROGRAPH;
23001 RAIN GAGE;
23002 WEATHER RADAR;
23003 TRIPLE REGISTER;
24001 HYGROMETER;
24002 HYGROTHERMOGRAPH;
26001 TRIPLE REGISTER;
26002 NET RAD. RECORDER;
27001 THERMISTOR;
30001 FATHOMETER;
30002 LEAD LINE;
30003 SEA SLED;
30004 FIXED STAKES;
30005 SOUNDING ROD, VISUAL;
30006 ROD AND HORIZON;
30007 SIDE SCAN SONAR;
31001 SIEVING;
31002 SETTLING TUBE/RSA;
31003 GRAB SAMPLE;
31004 RADIOACTIVE TRACER;
31005 SURFACE SCOOP;
31006 PRESSURE DIFF. RSA;
31007 CUMULATIVE WT. RSA;
31008 BCH PROFILE VOL CHNG;
31009 PUMP SAMPLER;
31010 FLOURESCENT TRACER;
31011 DRAG SAMPLER;
31012 WATER SAMPLE;
31013 PRESSURE DIFFERENCE;
32001 ESTIMATED;
32002 HANDLEVEL;
32003 INCLINOMETER;
32004 ROD AND TRANSIT;
32005 FIXED STAKES;
32006 ROD-AND-HORIZON;
32007 LEVEL AND TAPE;
32008 LEAD LINE;
32009 PARALLELOGRAM FRAME;

RCD-TYPE

1 PRIMARY:
2 SECONDARY;
3 COMPLEMENTARY;

MODEL TYPE

0 UNKNOWN;
1 SEE REMARKS;
2 NUMERICAL;
3 SIMULATION;
4 PHYSICAL;
5 STATISTICAL;
6 GRAPHIC;
7 MATHEMATICAL;
8 MIXED, SEE REMARKS;

HARDWARE TYPE

0 UNKNOWN;
1 SEE REMARKS;
2 DIGITAL;
3 ANALOG;
4 MANUAL;
5 HYBRID, SEE REMARKS;

SOURCE LANGUAGE

0 UNKNOWN;
1 SEE REMARKS;
2 FORTRAN;

OUTPUT MODE
0 UNKNOWN;
1 SEE REMARKS;
2 LINE PRINTER;
3 CRT DISPLAY;
4 STRIP CHART;
5 METER;
6 MAGNETIC TAPE;
7 PUNCHED PAPER TAPE;
8 COM (MICROFICHE);
9 AUDIO;
10 PHYSICAL;
11 PEN AND PAPER;

USABILITY
0 UNKNOWN;
1 SEE REMARKS;
2 UNDOCUMENTED;
3 EXTENSIVE PROGRAMMING REQUIRED;
4 SOME PROGRAMMING REQUIRED;
5 EASILY IMPLEMENTED;
6 FULLY IMPLEMENTED;
7 IN USE OPERATIONALLY;

APPENDIX I

Glossary of Terms

Glossary of Terms

Code
A numeric or alphabetic symbol used in place of a longer word or phrase in the computer file. These may be translated on output.

Coded element
An element whose input is in the form of a code.

DMS (data management system)
A set of computer programs designed to permit the input, storage, and retrieval of data.

Element
A named data unit in a file.

Entry
A single data value input to a file element.

File
A named set of data elements in which data can be input, stored, and retrieved under the control of a DMS. A file will contain many records each composed of a related subset of the file elements.

Formatted element
An element whose input form is subject to format specifications other than maximum size.

Format specifications
Restrictions on the form of input allowed in an element. These include size, numeric, alphabetic, range of values allowed, etc.

Free text (free format)
Format of input when only the maximum size of the element is specified. Free text is used for longer, textual type elements (REMARKS, PUBLICATNS, etc.).

Inverted element
Some DMS's use an "inverted" file containing only some of the elements in the whole file. These are called inverted elements and they are the only elements for which retrieval criteria can be specified in a query.

Query
: A procedure specified by the DMS for retrieving certain records from a file by specifying criteria that must be satisfied by certain elements.

Record
: A group of related elements in a file. A record will contain some or all of the elements in the set of elements defined for the file. Each record must include an element containing a number or code which uniquely identifies that record in the file. All elements in a given record will contain information about a single entity (data collection site, model, etc.)

Repeating element
: An element that may have more than one data entry in a single record.

Report
: A special printed output format defined for records in a file. The report definition specifies page and column headings, labels, the order in which elements in a record will be output, and the spacing between elements.

Update
: The process specified by the DMS for adding new records to a file or changing existing records.

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13. ABSTRACT

A computer assisted coastal information system has been developed which will refer the user to sources of coastal data on the requested parameters and describe the study which acquired the referenced data. Design and structure of the file and access program are described, with flow charts and sample input/output included. Information gathering and record input procedures are discussed.

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Coast						
Computer						
Information System						
File Structure						
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